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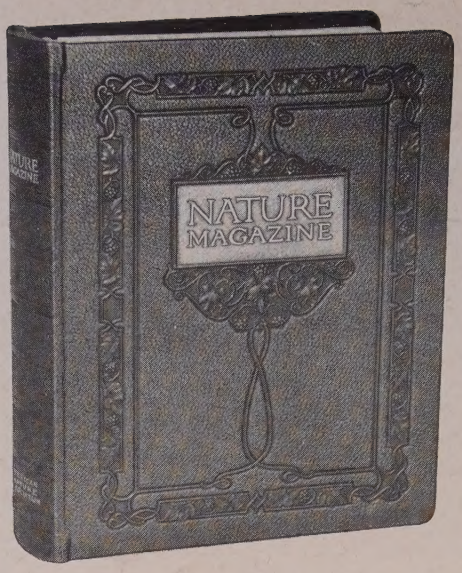

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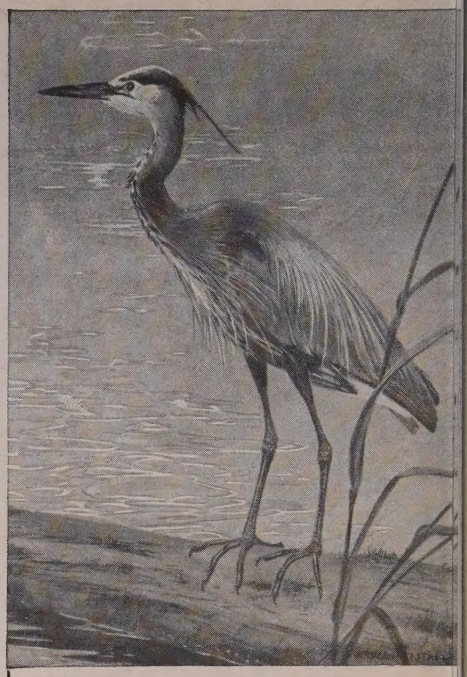

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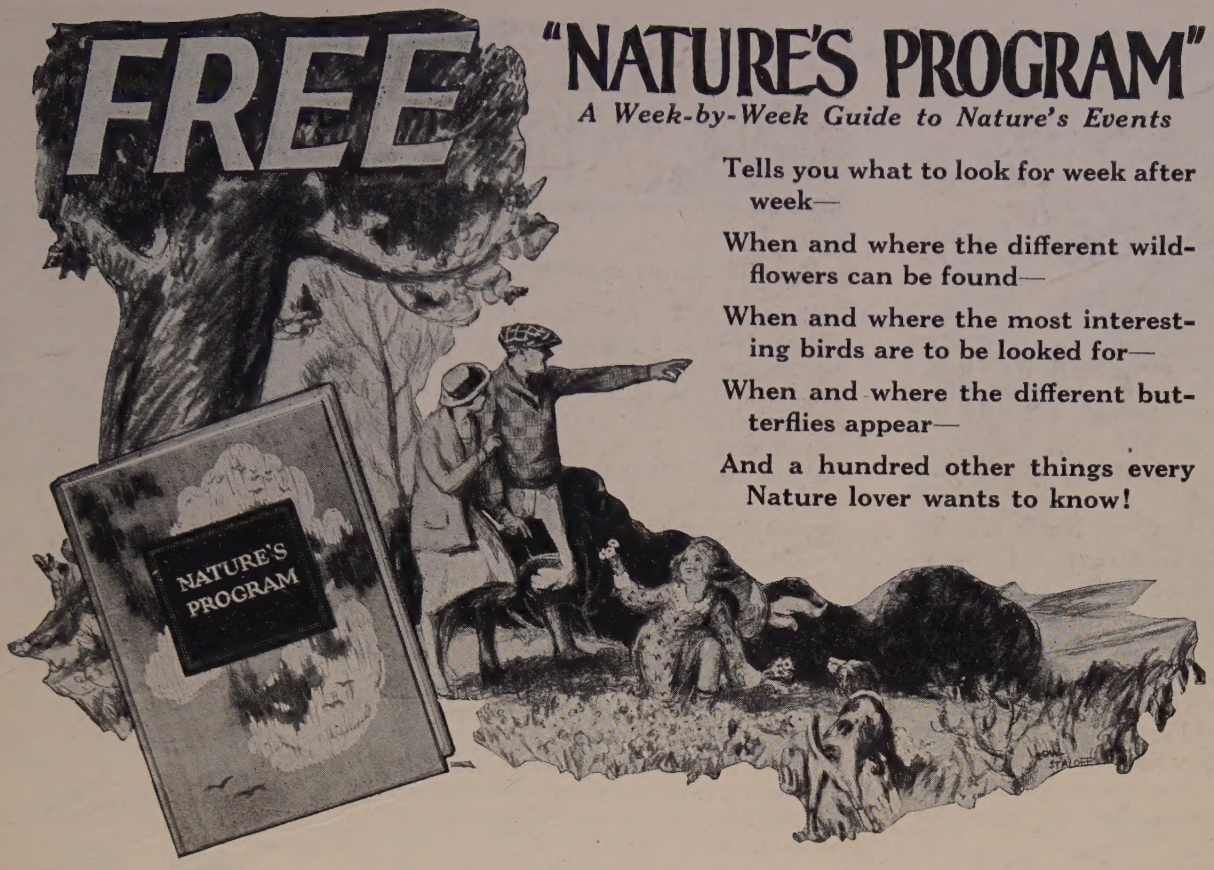

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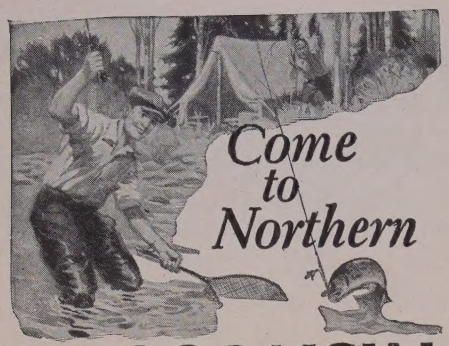

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Forestry Almanac

Dedicated to the memory of Franklin B. Hough, "who fifty years ago, in 1876, undertook the task of surveying the forest resources of the United States, by order of the Federal Government," the semi-centennial edition of *The Forestry Almanac* has just been published by the American Tree Association. Building upon the firm groundwork established in the first edition of the *Almanac,* the new edition is more than one hundred pages larger in size and covers much new ground. Ploughing strange ground as it did, the first edition necessarily suffered in a measure from omissions, a condition that has been more than remedied in the semi-centennial edition.

As in the original *Almanac*, there are included statements of the work of the United States Forest Service and its several branches; a résumé of the courses offered in the schools of forestry giving degrees; summaries of the histories of the various forestry and allied associations, their present activities and officers; statistics of the condition of forests and forestry in every state; résumé of the forestry situation in foreign countries; and a variety of other articles on various phases of work in the forestry and conservation field. The volume is available from the American Tree Association, 1214 16th St., N.W., Washington, D. C., for one dollar.

Plant Geography

To the observing traveler, particularly the one who does not follow the beaten trail, one of the greatest sources of interest is the differences seen in the plant life in varied climes and countries. The question naturally arises as to what influences these variations and the answer is a fascinating one. Douglas Houghton Campbell has presented the answer in attractive terms in *An Outline of Plant Geography,* published by The Macmillan Company of New York. The book is at once one of fine scientific and textbook value as well as distinctly entertaining reading.

Amazonian Termites

Entomologists will find bulletin No. 2615 of the Smithsonian Institution dealing with Termites collected on the Mulford Biological Exploration which went to the Amazon Basin in 1921–1922. The information has been prepared by Dr. Thomas E. Snyder and is presented in technical form.

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A Key to the Snakes

Herpetologists and many with a general interest in Nature will find that Dr. Frank N. Blanchard of the University of Michigan has done them a real service in his *Key to the Snakes of the United States, Canada and Lower California.* Dr. Blanchard has set out to supply a simple means for the prompt identification of the snakes in the region covered without dissection or need for examining the teeth, to provide a synopsis of the genera and species inhabiting this area, and establish as accurate a determination as possible of the distribution of each species and subspecies. More than that, he has succeeded in supplying something hitherto decidedly lacking, because a general reference work along this line is distinctly needed. The book is available, bound in cloth, from the General Library, University of Michigan, Ann Arbor, for $1.75.

California's Plants

Among the many notable things in California not the least interesting to the visiting plant lover are the trees and shrubs that line the highways and luxuriate in the yards and parks. The easterner with a botanical leaning is immediately struck with the exotic quality of the larger plant growth. It is therefore highly proper as well as distinctly valuable that Charles Francis Saunders should have written *Trees and Shrubs of California Gardens* and that Robert M. McBride and Company of New York should have published it. The ancestry of most of the trees and shrubs found from San Francisco southward is likewise exotic, because the past few decades have seen the importation from the corners of the earth of the plant growth of this originally somewhat barren section. Mr. Saunders has written their story entertainingly from the general reader's viewpoint and valuably from the botanical side. The volume sells for $3.00.

For Greenhouse Plants

Calcium cyanide during the last few years has attracted considerable attention from entomologists because of its promising insecticidal properties, says the United States Department of Agriculture. Of late this chemical compound has been used rather extensively in greenhouse insect warfare as a source of hydrocyanic-acid gas for fumigating purposes. It is a more convenient source of this gas than either potassium or sodium cyanide, as it does not require jars or the addition of sulphuric acid and water to generate the gas. A new Department Circular, No. 380-C, "Calcium Cyanide as a Fumigant for Ornamental Greenhouse Plants," gives details concerning the use of this chemical as a fumigant. A copy of the publication may be obtained free, as long as the supply lasts, by writing to the United States Department of Agriculture, Washington, D. C.

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A Nature Puzzle

By ALICE B. JOYNES

The following Nature Puzzle conceals a bird slogan of three words. The answer will be published in the September issue of NATURE MAGAZINE.

My first is in lark and in oriole, too,
My second is found in every cuckoo.
My third is in vireo, but not in jay,
My fourth is in grosbeak with song so gay.
My fifth is in tanager with brilliant coat,
My sixth in thrush with its liquid note.
My seventh is in redstart and also in grackle.
My eighth in catbird with its gleeful cackle.
My ninth is in martin but not in pewee,
My tenth in robin but not in chickadee.
My eleventh is in redpoll, and also in bluebird,
My twelfth in sparrow whose sweet song you heard.
My whole to follow will give much pleasure,
A source of interest far beyond measure.

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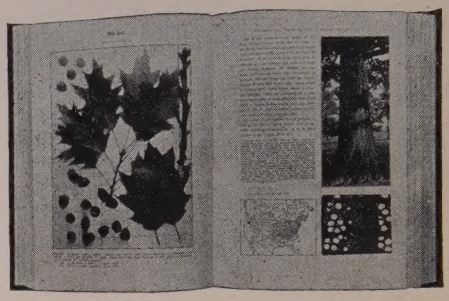

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Questions and Answers

The American Nature Association will be glad to answer each month such questions as its members ask about Nature.

QUESTION: *What is the fastest growing vine used in covering a house, and where can I get it?*—J. P.

ANSWER: The fastest growing vine known to us is the moonflower. This, however, dies down each year, sending out new shoots the next season from the root. A very satisfactory vine is the Virginia creeper, which, when established, grows very rapidly and profusely and is pleasing as a foliage plant, and for its berries, which form food for birds in the autumn. Either of these can be procured from any dealer in plants.

QUESTION: *What are the northern lights, and what causes them?*—A. B.

ANSWER: The latest theory regarding the northern lights, or aurora borealis, is that streams of light which have a short wave length strike the rare outside atmosphere of our earth, causing a light similar to rays in a Roentgen tube. This happens during the day as well as night, but, of course, the light cannot be seen except during darkness.

QUESTION: *Can you tell me whether any snakes spit something that has the appearance of fire or phosphorus?*—J. B. F.

ANSWER: Most snakes, when approached, dart out the tongue, and this must have been what you saw. Certainly no snakes spit anything of a phosphorescent nature unless possibly the poison spray which is rarely blown from the mouth by some species may have this appearance.

QUESTION: *Where do the cells that make red snow come from?*—D. McQ.

ANSWER: The little cells correspond, of course, to the seeds of higher plants. These tiny plants remain more or less dormant on the snow and ice of glaciers, and also probably on the rocks nearby during the colder parts of the year. With the coming of warm weather they become active, and are carried by the wind and scattered over new areas of snow, where they continue to grow and multiply.

QUESTION: *Can you tell me whether gold fish sleep at night?*—V. E. B.

ANSWER: All fishes have periods of inactivity which fulfills the purpose of sleep, though whether it is sleep as we understand it, we do not know. All sleep, however, even in man and others of the higher vertebrates, is merely a cessation or retardation of the functions of breathing, heart action, etc. Sleep therefore varies from mere resting to what we understand as deep sleep, and so on to what we call hibernation in the bear and some others, in which the sleep lasts for months. Fishes have similar habits of resting and this may be called sleep.

This picture illustrates an extreme case

Is hunger or thirst killing your trees?

Look at the tops of your trees. Are the leaves thin and yellowish? Are they undersized? Are they inclined to turn brownish and curl up? Are the uppermost parts of the trees thinner than the rest? Are there little dead branches showing at the tops of the trees?

These signs are unmistakable evidence of trouble. It is practically certain that such a tree is dying from either hunger or thirst or both. The tree is a living thing. It requires food, and it must have water. Under semi-artificial conditions, the soil is gradually exhausted of its food elements. Such a tree must be fed, for exactly the same reason that a good farmer fertilizes his fields. Get the advice of Davey Tree Surgeons quickly. They are local to you.

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NATURE MAGAZINE

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$3.00 a Year — 35c a Copy

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NATURE MAGAZINE is published monthly by the American Nature Association
Entered as second-class matter, March 4, 1924, at the Post Office at Washington, D. C., under the Act of March 3, 1879

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Title Registered U. S. Patent Office
Publication and Editorial Office, 1214 16th Street, Washington, D. C.
Western Office, 122 Michigan Boulevard, Chicago
Eastern Office, 171 Madison Ave., New York City

NATURE CALENDAR

JULY

"Mid-summer blooms within our quiet garden-ways;
A golden peacock down the dusky alley strays;
Gay flower petals strew
—Pearl, emerald and blue—
The curving slopes of fragrant summer grass;
The pools are clear as glass
Between the white cups of the lily-flowers;
The currants are like jeweled fairy-bowers;
A dazzling insect worries the heart of a rose,
Where a delicate fern a filmy shadow throws,
And airy as bubbles the thousand of bees
Over the young grape-clusters swarm as they please."
—EMILE VERHAEREN.

Nature's wild gardens are as thickly sown with flowers as any of man's acres. Fields and waste places are now fragrant bowers.

In the late afternoon the toad comes forth from his cool retreat under the shrubbery or porch and begins his search for food. Grasshoppers, crickets, locusts, beetles, flies, ants, squash bugs, plant-lice, spiders, cutworms and caterpillars are on his bill of fare.

As you cross the meadow or pasture, hundreds of small greenish insects leap before you in short flights. They are sap-sucking leaf hoppers, one of our grass pests.

Berries now are ripe, and the black bear concentrates his diet on this abundant natural resource.

The milk snake is a good mouser. Most of his hunting is done during the cooler time of the day.

Drowsy days are here. The hot, noonday sun, the droning of insects and the still, flower-perfumed air, all seem to voice the peacefulness of the midsummer day.

Near shores of lakes or large rivers, may-flies may be seen in great whirling swarms as they perform their mating flight or dance. They also are known as lake-flies, shad-flies or Canadian soldiers.

July is butterfly time when flower-grown, sunny places are regular carnival grounds for these beautiful creatures of the air.

The bluegills are especially greedy now and large catches can be made. These large sunfish are highly esteemed as pan-fish.

The black snake is laying her eggs under flat stones or in soft soil on some sunny bank. There are from twelve to twenty-four eggs in a nest.

The violet-blue flowers of chicory are blooming in fields and by the roadsides. On rainy or cloudy days they "close up shop" until the sun comes out again.

Lyra, Corona and Hercules are almost directly overhead in the early evenings.

The wind is shaking out clouds of gold dust from the horsetails in the swamps. This really is not dust but ripe, yellow spores.

Along the margins of ponds and rivers, young toads gather on sunny brown patches of earth. Having successfully passed the tadpole stage unharmed, they now must beware hungry snakes, crows and hawks, as well as many other land animals which prey upon them.

Bobolinks, tree swallows, red-wing blackbirds and grackles are early flockers. Already you may see them in small bands.

Mud daubers (the slender-waisted, nervous wasps) are now provisioning their nests of tubular cells built under the porch roof or eaves, with spiders which have been paralyzed with a sting. Thus they furnish live food for their young when they hatch.

At night the leaves of the red clover and the white clover fold together and bow in an attitude of prayer.

Conspicuous now in the evening sky is Antares, the brightest star in the constellation Scorpio. It is the largest star known.

The perfume of sweet white clover blossoms is heavy along country roads.

Beginning now and continuing throughout the summer, the woodchuck grows rounder and rounder as he stores up fat under his coat for the winter.

The pickerel weed is a wader. It raises its long spikes of ragged purplish flowers above large, shiny green leaves.

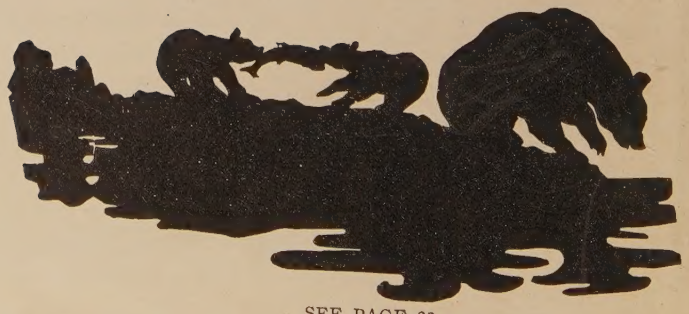
At this time of the year moose become semi-aquatic animals. In the cool waters of northern lakes and rivers they escape the heat and flies.

Giant water-bugs, or electric-light bugs, are attracted with many other insects to street lights. Their flying season is short, being primarily to find mates.

Prepared for NATURE MAGAZINE by the Cleveland Museum of Natural History

ALL IN THE LIFE OF A BEAR

SILHOUETTES
By JOE CRANSTOUN JONES



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PROVISO TOWNSHIP
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MAYWOOD, ILL.

Nature Magazine

R. BRUCE HORSFALL

Vol. VIII JULY, 1926 No. 1

Each gaze at the glories of earth, sky, and ocean,
To my kindled emotions was wind over flame.—BRYANT.

WILD ANIMAL FRIENDS OF YOSEMITE

By ENID R. MICHAEL

(PHOTOGRAPHS BY CHARLES W. MICHAEL)

OUR HOME is on the bank of the Merced River in the Yosemite Valley, surrounded by a softwood forest that each year adds to the soft, thick carpet upon the ground. Daily we may wander in any part of the valley glorying in its beauty, meeting its wild inhabitants. Three years ago, we frequently saw Rocky Mountain mule deer, and once in a while a cinnamon bear. The deer would raise startled heads on our approach, stare at us intently, and soon bound away into the forest. The bears were even more upset at our presence and would rush off in a wild panic. Once a great fellow ran up the steep, glaciated granite to escape, and another time one scaled a rock-filled mountain chimney, scattering the rocks upon us as he scrambled away. There are three apple orchards in the valley, the planting

AN EXAMPLE OF FRIENDLINESS

The wild animal inhabitants of our great national playgrounds are one of their notable assets. The author of this article is one of the naturalist staff at Yosemite.

BRUIN RESTING AFTER A FEAST

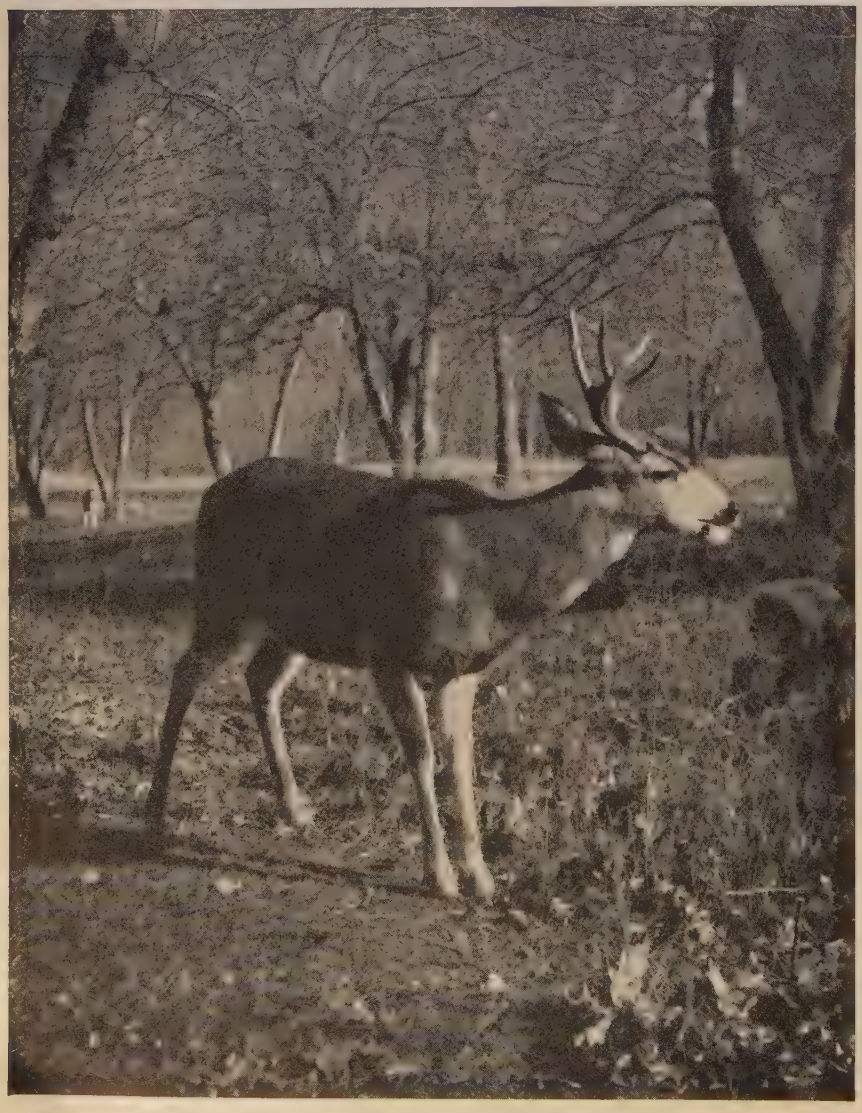
The bears delight in the apple orchards and gorge themselves at the bear pits, treating visitors in the park to an unusual entertainment at meal times.

of early pioneers, and apple trees spring up along the roads and in the meadows as though this were their native heath, much to the delight of the wild animals. The bears visit the orchards at night, climb the trees, shake down apples and feast. The deer seek the orchards, when the bears are gone, to get what is left.

One autumn afternoon I visited the orchard for a knapsack of apples. Having climbed a tree and filled my knapsack, I slid to the ground. To my surprise a pretty little spiked buck stood a few feet away, watching me expectantly. Confidently he came forward when I showed him an apple and bit off small bites as it was held up for him. After this we frequently met "Bucky-two-prong," as we called him, on our rambles about the valley, and we always had an apple or two for him. He liked the apples cut in small pieces and handed to him one at a time. His manner was always bold and confident and, while toward us he maintained a friendly tolerance, he had a fashion, when the apples were finished, of lowering his head and walking toward us.

(Below) BUCKY-TWO-PRONG IS A HANDSOME CHAP

It is well, however, to have the proper respect for his javelin-like horns and pointed hoofs.



THERE ARE OTHERS BESIDES DEAR MABEL

She has a marvelous appetite and makes the rounds, accumulating breakfasts on the way.

And we, having due respect for the javelins on his head as well as his small iron-like hoofs, were careful to give him no advantage. There were tales that Bucky-two-prong struck with his hoofs at anyone who teased him, and this is safer to believe than to test, after one glance at his kicking equipment.

Early the next spring a marked change came over the wild deer. They raised their heads with mild curiosity when humans approached but if not pressed they went on with their grazing. Occasionally one among the group stepped forward with interest and gladly took an apple if one were tossed.

One day a beautiful doe came to my window and looked in. She ate bread and joyfully munched bits of apple. She was unusually trim and graceful, and her large eyes spoke confidence and friendliness. Her snowy chin, the white rectangle on her neck, the immaculate gray coat, together with her aristocratic manner added to her charm. This is "Mabel Die," "Dear Mabel" as she came to be called, and Dear Mabel is one of our best loved citizens.

Mabel visits me often. She puts her head into the room as far as the window permits and would gladly come in if she could find the open door. In the morning Dear Mabel often appears early in the Yosemite Village street. She goes to the cafeteria and waits at the door for service. After this breakfast she takes a second at the Sentinel Hotel. Then

HE LOOKS LIKE A GIANT PENGUIN

We called him Penny and he pays no attention to his mother's protests against our pampering him.

she visits those of her friends that still remain in the valley. When she reaches our camp her appetite is still good, and she accepts vegetable peelings one at a time and is much pleased if handed thin, narrow slices of raisin bread. She has been known to eat a loaf of this and several apples and still crave more. In a generation she has thrown aside the instinctive fear of the most dreaded enemy of her ancestors and has learned not only to be friendly with men but to break bread with them.

There is Emelina Doe with two beautiful fawns. They are a gentle trio and like bread very much. Nancy Doe is a large lady with one child. Nancy is a little shy but does very well considering her upbringing. Funny-horn is a large buck with a curved spike on one side of his head and a three-branched antler on the other. He enjoys apples but has not learned to eat bread. Bucky-two-prong, now a handsome buck with branched antlers, comes too. The pine needles carpet about our camp is now decked with crisp, dry cottonwood and oak leaves. The mice and the flying squirrels moving about the ground in the evening cause a loud outcry from the leaves, but these large animals, stepping about with their measured tread and infinite grace, make scarcely a sound.

For many years the refuse has been emptied in a certain place some three miles down the valley from the village. This place has become known as the "Bear Pits" because of its popularity with the bears. Well-marked bear trails lead through the woods on both sides of the river to the pits, and in these woods one may often come upon Bruin resting after a feast, or see him swimming the river or emerging from the forest on his way to a banquet. The caretakers at the dump have been kind to the bears, and this treatment has encouraged the bears to become friendly. Now certain individuals walk cordially forward to greet the stranger and accept his sweets. All these bears are splendid specimens, and the majority have brown coats. There are a few, however, with very black fur, and one handsome black mother has one brown cub and one coal-black one.

Bill is an immense brown fellow with a white shirt front. He is always a gentleman, rearing to an amazing height upon his hind legs and daintily taking the lumps of sugar from the hand with a velvet tongue.

Freshy is another big brownie who loves a bottle filled with syrup. He grips the hands that hold the bottle for him with his powerful

BILL IS ALWAYS A GENTLEMAN (Below)

He will rear to an amazing height and daintily take lumps of sugar with a velvet tongue.

paws and, with a grasp like iron, holds on till the last drop is drained. Our favorite among the bears is Penny. He comes to our camp in the evening and waits in silence outside until we see him. Then, with a bashful air, both comical and delightful, he stands upon his hind legs and begs for sugar. He is a young bear and, standing with his paws drooped down and the long, white belly-streak exposed, he is a quaint, appealing little figure looking like a giant penguin, so we named him Penguin. Penny's mother has none of her son's gentle ways. She resents the attentions given her son, and by way of showing her disapproval she lunges fiercely and seems about to blow up with the fierce outpuffs of her breath. But Penny pays not the slightest attention to her.

Although we have seen this great change take place in the attitude of the wild creatures to man in the Yosemite National Park, yet their hereditary attitude toward each other remains the same. One afternoon we saw two groups of bucks walking from the forest toward the apple orchard. They were large, splendid animals, and their lofty antlers, their swelling necks, and measured tread all bespoke unutterable pride. They strode along unconscious of us and seemed enchanted by their own perfection. Suddenly a she-bear loped out of the orchard and made in their direction. The proud kings broke and raced for the forest. And again, the bear enjoying a peaceful meal will cower and run if the shadow of an eagle sweeps along the ground.

To win the friendship of these wild forest creatures is one of the most delightful experiences that can come to men. The look of confidence in their eyes is full reward.

A-Fishing for Crawfish

By David J. Morris

SITTING down there in the water he looks like a friendly little fellow, the crawfish or crayfish. At first he does not notice your approach, then suddenly he flips his tail and turns facing you, staring with all his might with those black eyes sitting on the end of stilts. This is our crawfish who inhabit streams and ponds, especially in East Texas and Louisiana, where it takes possession of whole swamps and these become known as crawfish ponds. When these ponds dry up the crawfish literally cover the whole bottom with their mounds, built up as they dig to water.

In going into his hole the crawfish always shoots in backwards and is thus ready to defend his home with his large pinchers. If he is too far away from the hole, he will offer fight on the spot by raising up on his tail, large claws held up and wide open, ready to take a piece of your finger if it comes in reach. He will turn round and round after your finger, and it is hard to catch him unawares so that you can grab him right back of the front pinchers and thus hold him without danger.

He is grayish, blue, or sometimes red in color. There are four pairs of legs behind the fore pinchers and two pairs of small legs under the head at the mouth that assist him in holding his food which consists of water bugs, dead fish, sometimes other crawfish, some moss and a few other things his menu may call for. Under the tail are several pairs of swimmerets which the mother crawfish uses to carry the little, young crawfish about with for several days or weeks. When born the young resemble the mature crawfish.

By flips of the tail the crawfish move through the water backward when they desire to go fast. Otherwise they walk forward with the fore pinchers held up off the bottom. In digging their holes they use the fore claws to roll the dirt upward and place it around the top of the hole, forming mounds. When the weather becomes dry they dig down; it is not known how far, but a small stone dropped into the hole can be heard rolling down for quite a distance and usually strikes water. It is necessary for them to keep their gills damp to live. Often, after a year of drought, they will appear in great numbers after a big rain. The idea that they rain down, however, is incorrect.

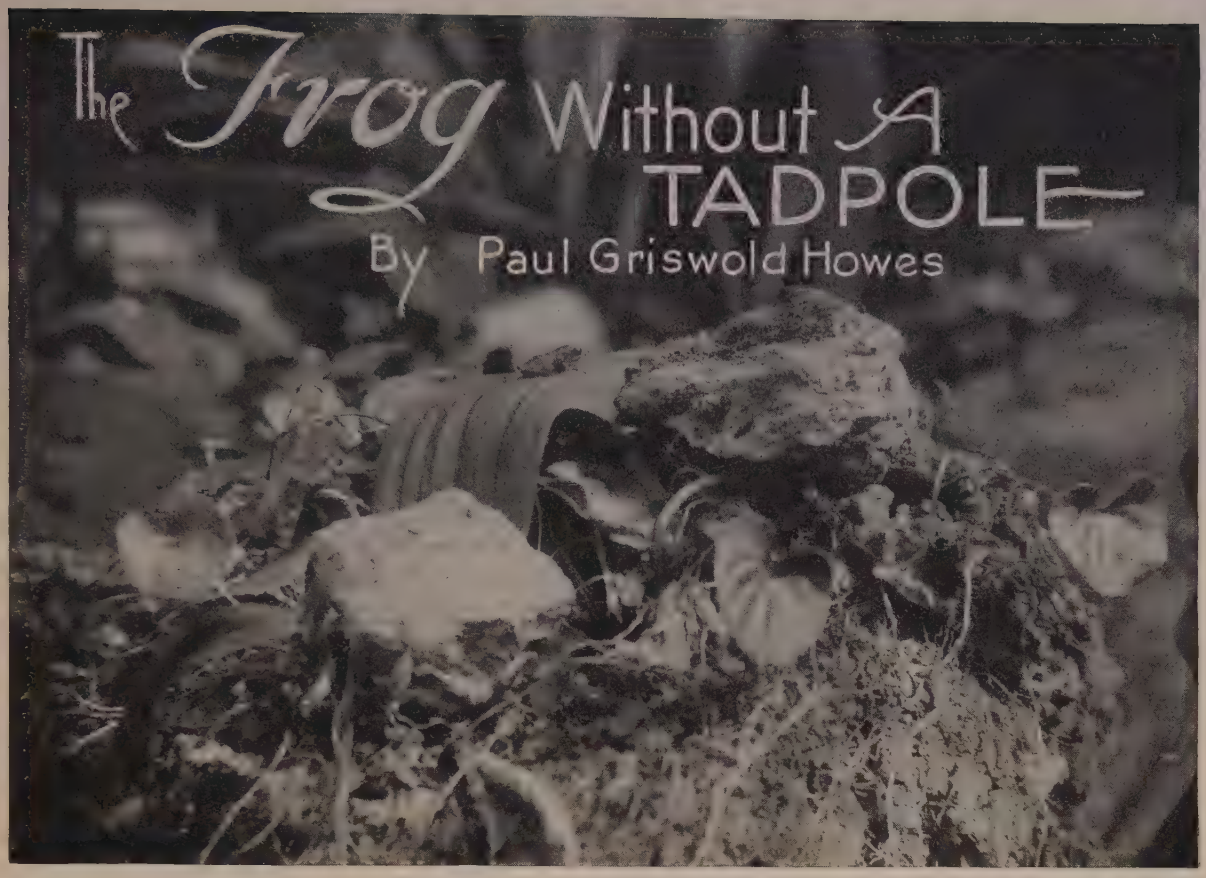
HE LOOKS LIKE A FRIENDLY FELLOW

This photograph of a Texas crawfish shows him about five-sevenths his actual size.

Crawfish are not as large as lobsters, but they make fine eating and in some sections are fished for extensively. In sections where it is necessary to build levees, and other water construction, the crawfish often undermine these and cause serious damage, and in this case they can hardly be considered of economic value as they are often very injurious.

The Frog Without A TADPOLE

By Paul Griswold Howes



PHOTOGRAPHS BY THE AUTHOR

A TINY FROGLET RECENTLY FROM THE EGG

Note the tiny mite directly beneath the author's first name, sitting on a leaf and viewing the world.

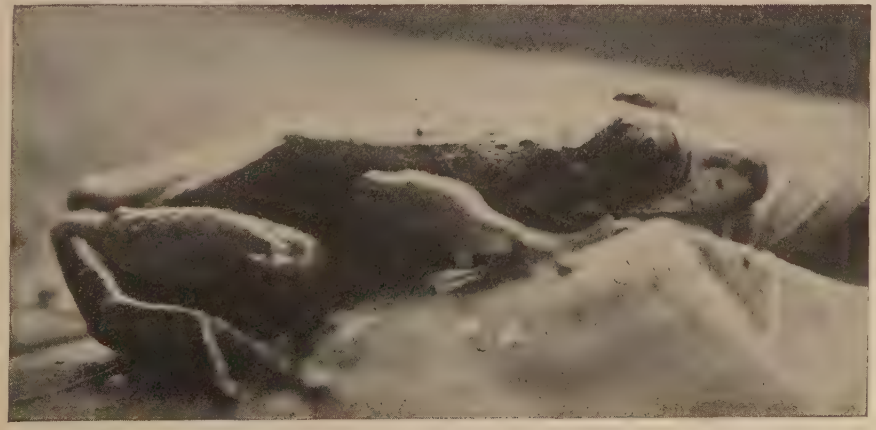
BEFORE arriving in Dominica, I had made a mental note to the effect that I would be particularly watchful for frogs, toads or salamanders, for there is so little really known with regard to these creatures in these islands of the Caribbean. Much to my regret, however, after the establishment of our Biological Station at Corona, this particular form of life was found to be very poorly represented, at least in the number of species.

There are only three tree frogs apparently. These are very common and quite small, measuring about an inch in length when full grown. There are no toads and no salamanders to be seen, and although there are some other batrachians at lower altitudes, here at eighteen hundred feet and thereabouts we must be content with three.

As things have turned out, one of these frogs has proved to be worth a hundred ordinary species, for its life history, which I have fortunately been able to unravel at the last minute of my first year's work on this island, has, all by itself, repaid me for the time and effort of the whole expedition.

The truth is, in a word, that this little forest frog skips the tadpole stage entirely. It affords us a beautiful illustration of the process of evolution, before our very eyes, the animal bettering itself by the natural process, and fitting itself perfectly into the notch caused by environment.

This is the second article by Mr. Howes based upon the research work done at the Biological Station in Dominica. The author has several other interesting stories to tell in forthcoming issues.

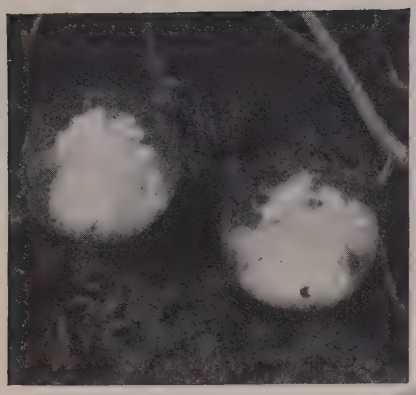


THE MATURE TADPOLELESS FROG

The picture shows a considerable enlargement of this interesting citizen of the Island of Dominica.

The frog is brown and gray like the leaves of the deep forest floor, and while its tiny toes are fitted with little clinging disks like our tree frogs at home, I have never found it except on the moist, brown leaves and mould, far, far away from the tree tops.

For three full months I searched the country about Corona for tadpoles, for this is often the very best method of obtaining new frogs. In all that time not a



TWO GLASS-LIKE EGGS

The cream-colored embryo can be seen in dim outline within.

caused by the filling of holes, where earth has been removed to construct the Imperial Road or other trails, but these pondlets have come too late, long after the evolution of our frog without a tadpole.

Next I searched the rivers and streams and brooklets, but to no avail. They are of two kinds. One a roaring torrent, far too swift for tiny detached eggs, the other a rushing river today but as dry as can be after three days of dry weather, for these last are but rain carriers that serve their purpose after every storm and then go dry until the next one dumps its water upon the mountains again.

Besides all this, the hollows of the forest that might form pools in level country will not hold water here. The pull is too great in this rugged land, and the water is soon drained away.

Then came the red letter days of March first and tenth. I found the eggs of this frog.

They were lying in plain sight upon the rich wet forest mould, not all in a mass but strung out over ten inches, one here, five there, or a larger group beyond. At first I took them to be the eggs of a salamander. As they were as clear as glass, a hasty field examination showed them to be certainly the product of an amphibian of some sort. It was not until some days later that I saw with delight that the tiny cream-colored embryos were actually developing into the minutest of frogs, at this time exactly a quarter of an inch in length!

Not all of this length was actually frog, for the tail of the one-time free-swimming tadpole was still possessed by each, and this accounted for half of this measurement. How long ago must it have been that this species, like the great majority of the amphibian tribe, passed through the usual stages of egg and tadpole to frog? Why has it evolved in such a way as to do away with the water-living tadpole in a country where there is nearly three hundred inches of rainfall annually?

Before I knew the truth about this absorbingly interesting life history, the comparatively huge size of the freshly deposited eggs appeared at once significant. It seemed certain that there must be something very unusual about a mature frog, measuring one inch in length, that laid eggs upon the bare ground, each of which was nearly a quarter of an inch in diameter.

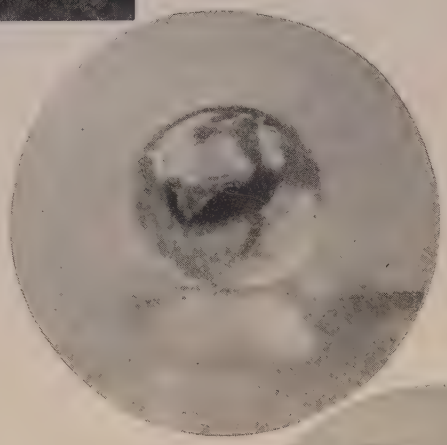
At home, our big garden toads and pond frogs do nothing like this. They place them in the water and each individual egg is quite small, perhaps only an eighth of an inch in diameter. How, then, in view of all this, might such a ponderous vehicle such as that of our little forest frog have evolved? That great envelope, and that correspondingly greater food-mass or yolk!

Let us suppose that, however and whenever the species originally reached Dominica, it first deposited its eggs in such water as it could find that seemed suitable for the purpose. Such desirable places could only be had in the form of rapidly drying rain pools or the water caught in the leaves of bromeliads. This last possibility eliminates itself, as the species lives only upon the ground, and we are reduced to the other form of water supply.

In a normal frog's egg the tadpole moves to the outside of the jelly covering as the development proceeds, where it remains for a time before taking up its swimming life, but if it were to find itself in a dry medium upon arriving outside the egg, would it not naturally wiggle back into the more hospitable jelly?

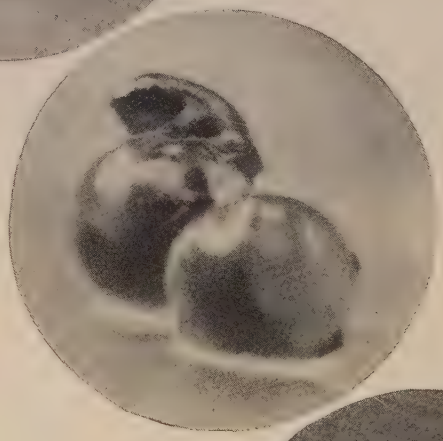
This would not require intelligence. It would be the tadpole's natural reaction under the circumstances, and thus I believe the first of our frogs in question may have acted when they found themselves in a dry "pool."

At first many must have died, but natural selection entered here, and those eggs that contained the greatest amount of food matter, for there is variation in everything, produced the tadpoles that survived



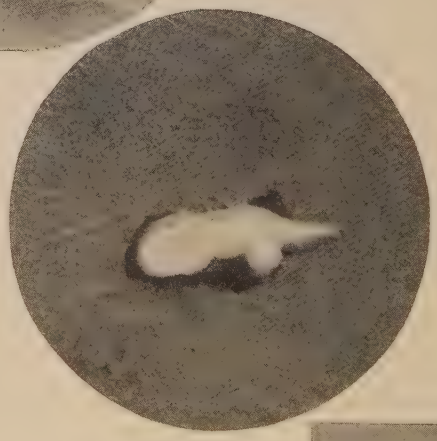
JUST BEFORE HATCHING

The tiny frog within its crystal-like sphere of jelly.



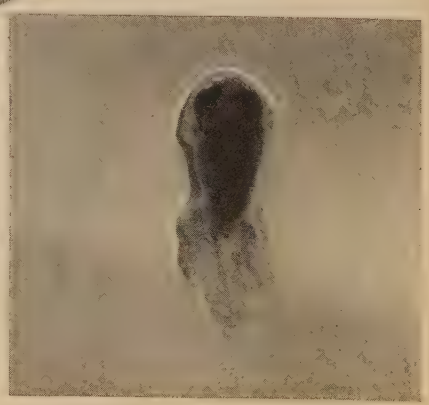
JUST AFTER HATCHING

The frog sits upon another egg, a film of water covering.



HALF DEVELOPED FROG

The embryo has been removed from the egg before hatching.

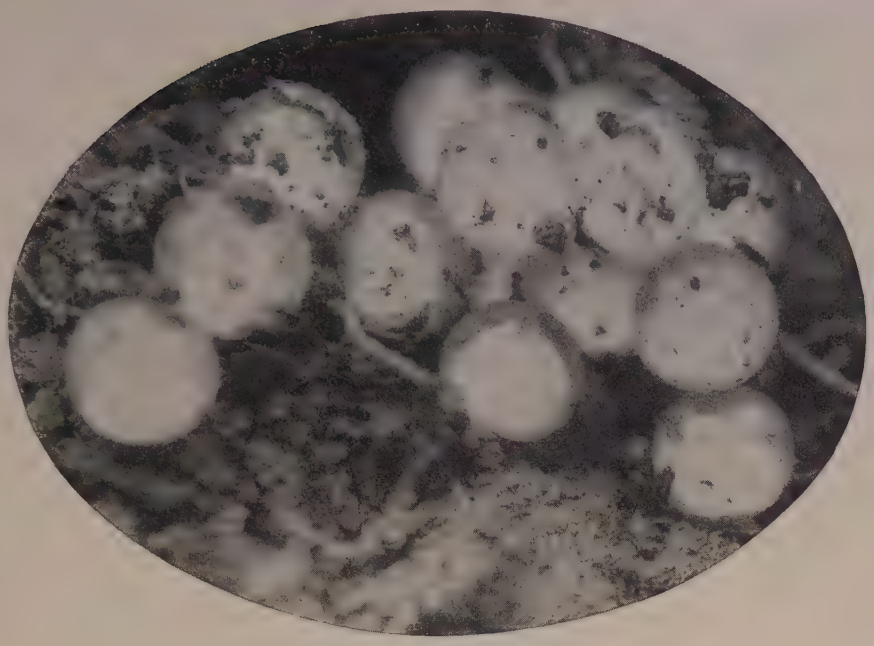


SHOWING A LATER STAGE

The tadpole tail which is absorbed as development progresses can be seen.

the longest, and some of these eventually reached maturity.

Thus may the seed have been sown that now has borne the frog without a tadpole. Generation after generation may have left the eggs at an ever so slightly later period in their lives. Under these conditions, as I have said, the largest eggs continued to produce the surviving individuals, and thus the greater food mass and the more advanced frog were evolved at the same time.



A GROUP OF FIFTEEN EGGS

The two white spots upon the embryo within the lower central egg are part of the brain showing through the tissue.

Today we see the tadpole stage within the egg with its distinct tail for propelling the individual to its food, but before long this disappears and out steps a perfect little frog, fitted for terrestrial life as well as we ourselves are. Behold a frog that has risen, at least in its life history, to the elevation of the next order of living things, the reptiles!

This frog has been identified, by Dr. G. K. Noble of The American Museum of Natural History, as *Eleutherodactylus martinicensis*. According to Dr. Noble, it has been a moot question whether or not this species possessed external gills during its early stages of development, and I am glad to have been able to find that it does, thus clearing up this point.

To watch the rapidity of this mite's development within the egg is indeed a revelation. At first we see but the cream-colored yolk within a sphere like crystal glass. The embryo appears shortly, lying on its soft bed of nourishment, its back facing the light. It is cream-colored also, for a time, and as it lengthens out as days go by, the power of motion comes to its feeble, budding limbs and tail.

In the middle of its life within the egg, it becomes very active, so that the least disturbance causes a rapid lashing of its tail. When I picked up the eggs in the forest, each embryo protested in this manner with a most remarkable exhibition of energy, unusual at this stage.

Another five days pass, and pigment commences to cloud the creamy tissue. It comes as tiny stellate forms of black that throw their arms in every direction like the flight of stars from a bursting rocket. These streamers meet others in their flight, and so the color at length tints the entire body.

The eyes turn dark also, and gold flows in from some mysterious source to put glory in tiny orbs of sight. Finally, the perfect frog comes forth a mere speck in the world of strife. It is all so delicate, so beautiful and mysterious, one marvels at this great free school wherein are teachers such as this.

This is only another of Dominica's mysteries, a child of a land peculiarly endowed with anomalies!

TEXAS MOCKINGBIRD

SELECTION of a typical bird for the post of State Bird is an endeavor that Nature lovers in every state might well make a part of their programs. Here is pictured the famed troubadour of Dixie, the Texas mockingbird.

The Outdoor Nature Club of Houston, Texas, a wide-awake organization if there ever was one, has been actively urging the selection of this favorite songster as State Bird of the Lone Star State. No official action is expected before the next session of the legislature, but in the interim the club is actively urging Texans to make their choice of a bird. Florida also favors this bird.

CANDIDATE FOR HONORS

While the Houston group particularly supports this songster because of its range all over the state, it announces that it is willing to accept the majority opinion if that opinion should happen to fall upon the scissor-tailed fly-catcher, the Texas bird of Paradise, or the cardinal, for each of which there is reported to be some sentiment.

The main issue involved is the selection of an official bird, a fine movement and one that might well be generally extended to flowers, trees and mammals in every state. Neither does it matter particularly if more than one state selects the same subject for official honors so long as some such action is taken.

THERE ARE QUALITIES OF HEART IN CHICKENDOM

Much has been said that would brand the hen as most scatterbrained, but the cautious scholar will not jump at conclusions.

PHOTOGRAPH H. ARMSTRONG ROBERTS

PERHAPS OFFSPRING OF THE LITTLE RED HEN

PHOTOGRAPH J. C. ALLEN

Her story, whimsical though it may be, gropes somewhere around the sources of truth.

THROUGH A WIRE MESH

By Ben Hur Lampman

APART from the sprightly story of the Little Small Red Hen, which may be termed a matter of record, I have nowhere discovered in the thick volumes of the poultry fanciers a least mention of those qualities of mind, and, I may say, of heart, which are occasionally remarked in the barnyard chicken of whatever breed. Much is written of the disposition of the various breeds to shatter egg records, or to prepare themselves for market in the briefest of possible periods, but the mentality of Chanticleer and his consort is as a fallow field for comment. Indeed, what little has been said is of a bumptious and superior tenor, leading all incautious scholars to conclude that there are few creatures more scatterbrained and impossible, from a cultural viewpoint.

How many have been thrilled at the brave story of the Little Small Red Hen? In this article Mr. Lampman with his usual charm of writing and infinite understanding, has done full justice to our birds of the barnyard. The hencoop is a fertile field for Nature study, as the author shows.

In all likelihood you are fairly conversant with the story that tells of the Little Small Red Hen, and of how she passed, with credit to herself, through an adventure demanding wit, prudence and courage in equal proportions. There is no harm, however, in recalling the account of this affair—as it is given in certain gay booklets printed for children—to the end that memory may be refreshed, and the point at issue illuminated. She had been taken captive, and popped into a sack, by no less a villain than Red Fox. As he toted her down the hollow and over the hill, grinning evilly, she did not lose heart for a moment. Not she. Out came her scissors, and snip-snap they slashed, and she hopped to the lane behind him. And then and there the Little Small Red Hen tossed rocks in the sack to delude him. When the rascal shook these into a pot, at half after twelve, the boiling water surged up and scalded him to death.

Well, that is an old wife's tale, contrived for the enjoyment of grandchildren, and as such it is ever so absurd. There are many persons today, convinced of their mission to banish all fancy, all fantastic whimsicality, from children's libraries and life itself, who will tell you this story should never be told. Yet I am abandoned enough to contend that the narrative of the Little Small Red Hen, in all its reprehensible mendacity — if reprehensible it is — gropes somewhere around the sources of truth. And toward this conclusion I am impelled, however semi-seriously, by proofs I am at loss to refute.

A number of years ago, when I had considerable leisure for such researches, by reason of neglecting less important problems, I engaged in a study of the personality of a rooster named Jacob. His coat, you see, was of many colors. It would have been quite impossible for the most learned fancier to unsnarl the riddle of Jacob's ancestry. He was, in the main, a cock-chicken, but there was a hint of the cassowary in his long-shanked speed, and his pomposity was that of the peafowl. It is my belief that Jacob was not as other chickens, but was an individual, such as Nature occasionally introduces into the lower orders, by way of tentative experiment. That he was a wiseacre of sorts was quite evident, and I have observed him when one might plainly

note that he was thinking—nay, might almost hear the endeavor, so bent was he upon a rational solution of his problem, whatever it might have been. Of Jacob's wit and resource one example, and the most conspicuous of all, should suffice.

Jacob and his flock were sheltered in one-half of a barn. Between these quarters and the poultry yard intervened a room intended for poultry, but given over to storage. There was originally no entrance to the yard save from this prohibited second half of the structure. The problem, therefore, was to find a means of exit and entrance from and to the available quarters, that the poultry yard might be used. Although more experienced persons laughed at the suggestion and bade me know that chickens would never use such a device, I tunneled beneath the warehouse, a distance of a dozen feet or so, and sided this dark and narrow passage with boards. There was barely room for a fat hen, scuttling along on her wishbone, to win through to that square of light which indicated the yard beyond—and that only if she paused midway for breath and composure. Yet it proved a practicable plan, for the flock did employ the makeshift, and multicolored Jacob first of all. For days, I should add, the distrust of the hens was marked, and a fortnight passed before the more timorous ones entered the passage blithely. But Jacob, the rascal, thought it a great novelty almost from the beginning, and was given to chortling as he hunched his way along it.

PHOTOGRAPH H. ARMSTRONG ROBERTS

CHANTICLEER SETS UP HIS MUSIC STAND

The mentality of this chap and his consort are too readily accepted as fallow field for comment.

I have here a confession to make. At that time I was a country editor, and one day in pursuit of my calling I accepted, in lieu of cash, and gladly enough, several plump and personable Plymouth Rock hens, of a temperament most phlegmatic and docile. There may be some who will say that this negotiation lowered the standards of journalism, and, indeed, I have no quarrel with that construction. Yet at the moment I saw nothing wrong in this, and beyond doubt I was in need of settlements for subscriptions, whether made in a pecuniary medium or by barter. This word "pecuniary," did it not once signify property in cattle, when cattle were the equivalent of cash? Thoughtless I may have been, but I needed the hens, and I had both historic and immediate justification. It was my whim, as I carried the Plymouth Rocks homeward and into the barn, that I should like very much to see Jacob's face when he met them. Jacob was such a droll fellow. He never could keep his emotions to himself.

There was none of the flock in that dusty, darkened chamber. The nests were empty, and, as they say in the sub-titles, the birds had flown. All were in the summer sunshine of the yard, whence Jacob's constant, braggart voice was plainly to be heard. He was an inveterate conversationalist. He was as tireless in this respect as a minor politician. The Plymouth Rocks, walking solemnly about their new quarters, held speech in low, lady-like cluckings. They approved the nesting facilities. They scratched abstractedly in the litter. And presently silence entered the barn. Well, I knew what that meant. It signified an extraordinary course of conduct on the part of Jacob. He had ceased talking for once. He was listening. It was unprecedented. And I was so certain of this that I stooped and peered down that narrow passage, being rewarded by a view of Jacob's crested head, intently inclined. The two of us, both investigators in a manner of speaking, were peeping from our respective ends of the corridor. Then in he popped.

He bubbled with zest and eloquence as he came through, huddling along; and he emerged from that subway the proudest rooster in the township. There never was the slightest doubt of Jacob's good opinion of Jacob, and I am persuaded that he talked to those hens like a book-agent. And then befell an astonishing thing—for he led them to the portal of the passage, and he and one of the comely hens thrust their heads down to it and looked through at distant daylight, the plausible scalawag talking all the while. I am sure he thought he had convinced her that it was not to be feared, for he plunged into the tunnel and went happily out again, doubtless trusting that she and her sisters would follow. But the student

hen turned dubiously away, and the others tracked after her. It was quite beyond their experience, that exit. Out in the yard, Jacob recited his lyric of their charms to an attentive flock. When he ceased, rather abruptly, I knew what I knew. And there he was, looking a question into the corridor.

If roosters use harsh words, he employed not a few of these as he hustled down the passage again and burst into the barn. He was in stormy mood, indeed, and yet he was admirably masterful. He told them to look, and they looked —dutiful heads peering beside his wrathful wattles—and with that he flounced into the corridor. To the last hen of them they followed meekly, sticking a bit, here or there, but worrying through. And what do you make of that?

It was about that time we owned Lady, a smallish hen of sullied strain, who had a green feather in one gray wing. Deepest shame comes over me yet, when I recall that she was slain, wholly in error, on a dark morning in mid-winter.

"This chicken was not a pullet," said the mistress of the house, as we sat at dinner. "I've cooked it all day, and yet——" The last was illustrated with a fork.

"Had she," I ventured fearfully, "a green feather in the left wing?"

"I seem to remember that she had"—slowly. Together we pushed our plates aside. There really was nothing to be said—that one wished to say. The episode was grotesque, preposterous, unthinkable. It so remains.

Little Willie was another chicken whose memory is as green as the salad stuffs of which he made such havoc. When Willie came from the egg he was a weakling, and his husky brothers and sisters shoved and hustled him without mercy. He had the sad, curved beak of the ailing

THE QUARTET IS READY TO PERFORM PHOTOGRAPH J. C. ALLEN

All in voice with their diminutive "Peep, Peep," they manage to be heard if not harmonious.

I suspect that Lady, in her gallinaceous heart, reversed the circumstance and believed that she owned us, for she was disposed to quit the flock at any time for the companionship of the family. It should be clearly understood that Lady also was an individual, and that she expressed her individualism by proffering a ready and confiding friendship, which there was no escaping. Her gentle demeanor won for her the name, and in a brief time she responded to it, although no other hen recognized the syllables as of especial significance.

In the fall of the year, when Lady and her sisters of the seraglio were permitted to go afield after hoppers, she would, at the distance of a hundred yards, answer to her pet name by racing home, half a-wing. She did not associate this call with the idea of food, but would crouch to flutter up to your shoulder, where she perched contentedly, crooning a minor song and closing her eyes sleepily. Poor Lady!

chick, and that appearance of introspective bewilderment. He was abject woe in down and pin-feathers. Removed from the hutch, at the behest of pity, Willie soon learned to teeter feebly about in exploration of the lawn, and, as strength crept into his weazened body, to rejoice in living, and particularly to rejoice in friendship. If his people deserted him it was his habit to seek the kitchen doorway and make dismal, plaintive recital of his lonely state. And, chick though he was, he knew his name almost before his wings were feathered and would come pelting over the grass when he heard it. That is to say, he would when he chose; for at times he hid away in the cucumber vines and watched covertly, and would not show himself until you turned to leave. Then with a skip and a flurry he would be at your heels, well pleased with his deceit. Peep! Weep! Peep! The very idea of being mistaken for a sort of godfather by an awkward, spindling, pin-feathered cockerel!

Little Willie had many adventures, not to say mishaps, before he grew to roosterhood and put aside childish things. The tame bees that sipped nectar from the white clover of the lawn were, at the first, quite comforting to swallow. One wondered why they were not tobasco to Willie's gullet, and I suspect that, generally speaking, he knew a means of pacifying them, or that the brown-plush vixens were too astounded to sting, or something. One afternoon, however, when Little Willie walked nimbly up to a clover blossom and downed his three-o'clock bee, something went amiss. Possibly the bee descended crosswise, which of itself would be enough to make any bee quite cross. Willie gulped confidently and lifted foot to trot away, then paused in evident consternation. An odd grimace of dismay flashed across his ingenuous countenance, and he widened his eyes and blinked them rapidly. Then he cuffed whirringly at his throat, and gulped again, and we knew that the worst had happened. The bee wasn't agreeing with him. Very gingerly he walked into a shadow, hunched himself to ruffled roundness, and meditated for an hour or more. But before the afternoon had passed he was ubiquitous and happy again, save that he denied—and always thereafter—the least interest in bees. They became Little Willie's taboo.

PHOTOGRAPH H. T. MIDDLETON

JACOB'S FLOCK LIVED IN HALF A BARN

"A country editor, I accepted, in lieu of cash, several plump and personable Plymouth Rock hens."

The heavier breeds of chickens are, by reason of their sanguine dispositions, more apt to produce individual birds that will nominate themselves for human friendship. Instinctive fear clutches always at the pattering hearts of the lighter breeds, but from these, also, arise real characters. Thus while Isabella Perkins, a chicken much beloved for her manifest intelligence and the quaintness of her humor, was a somewhat ponderous Rhode Island Red, the vivacity and affection of Sweetheart are equally memorable. And Sweetheart, whose name attested her disposition, was of the Ancona breed, that is slender, nimble and ordinarily nervous to the verge of hysteria. Sweetheart, one of twenty Anconas, was the sole sister of the flock to put fear behind her and regard her keepers as trusted friends. She, too, knew her name and answered it gladly. But, unhappily, Sweetheart died of a sickness.

Perhaps I make too much of this point, yet it returns to me with ever-increasing insistence—the lower animals are individuals, as we are; they differ one from another, in the same family; their reactions vary and their emotions are an individual quantity. Now and again the hand of Nature sets one of them so clearly apart that even our imperfect vision may take note of the deviation from mental type. These startling exceptions to the rule challenge me, they draw so near to the brink of a secret. And what is the secret? I confess that I do not know what Nature is about.

BR'ER RABBIT AND BR'ER FOX

HARDLY AN ADDITION TO THE SCENERY

An instance of unorganized outdoor advertising ruining a beautiful view and for which legislation is the only remedy.

Billboards Versus Beauty

By Arthur Newton Pack

President of the American Nature Association

There has been notable response in many ways to the Outdoors Good Manners call of the American Nature Association. This article is another good manners call, this time to the indiscriminate billboard that has the ill manners to ruin the natural beauties of the countryside. Many farsighted advertisers are lending their aid to the campaign for good manners in billboard advertising. Public sentiment is demanding action against thoughtless and uglifying commercialism.

TWINING its way upward along the side of the mountain, the road would lead us, we were told, to a marvelous view. A few hundred yards and it would twist out into the open, where we would find unfolded a panorama of lush valleys and distant purple hills. Such a view it would be—one to be silently, almost reverently, absorbed. The motor gained momentum as the highway flattened off. The last curve approached. And then—"BUY PAPOLIA—IT MAKES YOU OVER." In strident, clashing colors this promise shrieked from a broad and high expanse of sturdy billboard.

"I'd die first," declared one of the party, and none needed to ask why came such a remark.

WHAT LIES ACROSS THE BAY?

The barricading billboards deny an answer to the motorist as he arrives. An instance of ill manners in billboards.

Once beyond the barring way of the sign, the view lay before us. No doubt it was as beautiful as friends had said, but a sharply whetted appetite had been ruined. The garish lettering of Papolia danced before one's eyes, blurring the expanse of mountain and meadow.

The United States is a nation of immense natural resources. Not the least of these is the beauty of the land, an asset not limited to areas set aside as great national playgrounds, or to smaller areas of natural loveliness set aside by states and communities, but a part of the country itself. Commerce and civilization have battered much of this beauty. This was inevitable and, even, necessary in some measure, but in many

crying instances it has been the result of thoughtlessness and carelessness.

One of the things that the United States has given to the world is the development of the science of advertising. It has created a fine profession led by men of keen intellect, expert in estimating the public mind and able in marketing the myriad products of a great nation. But just as the unethical doctor and the shady lawyer may offend in the professions of law and medicine, there may be offenses against good taste and society in the profession of advertising.

NATURE MADE AND MAN DESTROYED

A beautiful approach to a community that man has succeeded in uglifying into something far from beautiful.

It has offended to the extent that our great natural resource of beauty is threatened by commercialism. The quiet beauty of rural roads is giving way to the sordid ugliness of cheap business. Thousands of unattractive food stands smeared with garish handbills are springing up as America rolls about on rubber tires. Legions of garish billboards parade along the roadsides, shouting their wares blatantly to the exclusion of everything worth seeing.

Our park areas are preserved from these attacks, but the masses of the people cannot visit these localities to escape the offending billboard. They must depend upon the country near at hand to their homes, and it is there, generally, that there is the most offense. We must conserve and recreate our natural beauties nearby.

As is usually the case in instances of abuse there is growing up a real sentiment to this end. Several of the states have taken action to restrict the erection of offensive billboards along the highways. Civic bodies are aroused and local governments are awakening to the need of making their communities and the approaches to them attractive. Farseeing and public spirited national advertisers in many instances have realized that advertising that offends hurts rather than helps the sale of their products. The newspapers and magazines have cooperated widely and effectively.

It was natural that this rising tide of public sentiment should find form in organization. Two years ago the National Committee for Restriction of Outdoor Advertising was created to serve as a clearing house for interested groups. These number more than one hundred now, nation-wide in their scope and representing millions in their membership.

This committee is not fighting the outdoor advertising industry. It is not seeking to wipe out all billboards. It is aiming merely to confine billboards and all other outdoor advertising to commercial districts. The committee asserts that whatever the economic value of a billboard, that value does not warrant the destruction of outdoor beauty.

Massachusetts is just now a battleground,—as it frequently is in drives for improvement,—in connection with an effective restriction law. This act is in the form of an amendment to the constitution permitting the state to regulate and restrict "all advertising within public view." The resultant restrictions are under fire in the courts with the united billboard companies fighting them. Iowa has banned billboards from the right of way of its primary road system.

The issue is now clean cut. Shall it be America the Beautiful or America the Ugly? Utility and ugliness need not and must not come to mean the same thing. Beauty need not be sacrificed to either, and it will not if the sentiment of the people of the United States is victorious, as always.

If We Treated Our Homes as We Do Our Woods

BY J. N. DARLING

What a lucky thing folks never took to holding picnics in people's houses

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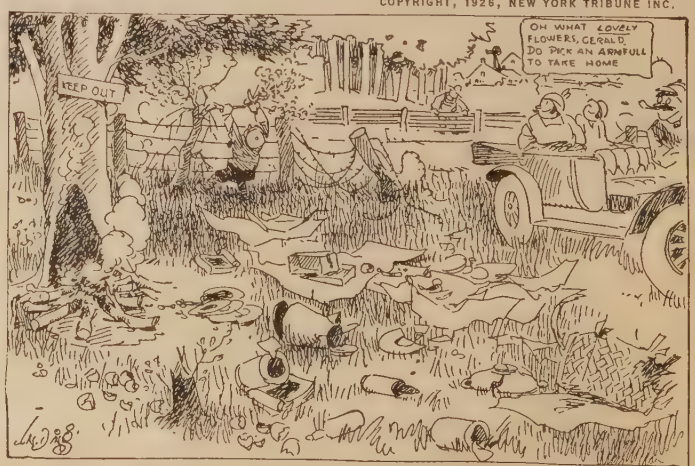
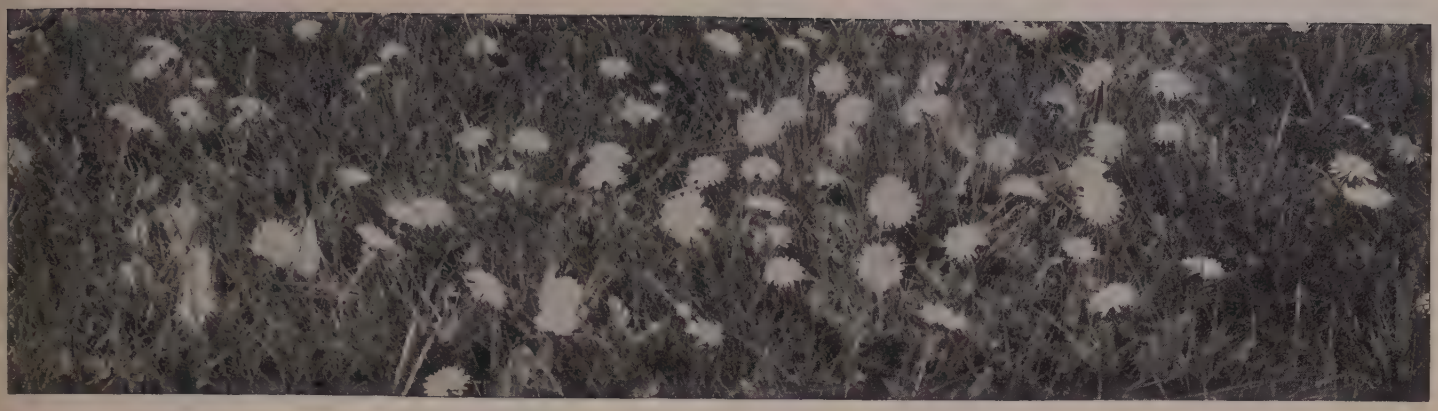


Moral: Take your indoor manners with you when you go outdoors



"DEAR COMMON FLOWER, THAT GROW'ST BESIDE THE WAY,
FRINGING THE DUSTY ROAD WITH HARMLESS GOLD"

THE TRAMP WITH THE GOLDEN CROWN

By Donald C. Peattie

A TRAMP with a golden crown is the dandelion, hobo of the plant world. It is indeed a king of hoboes, a vagrant that sets conquering foot upon the most inhospitable of territory, adapting itself to widely various environments, withstanding powerful enemies, and spreading its genial, if sometimes unwanted, presence over the earth. Since nothing succeeds like success, the cheery and indomitable dandelion wrings praise even from those who cannot welcome it.

Bold as is its beauty, this yellow tramp often suffers from familiarity. Were the sight new, what admiration would be waked by a meadow turned to a lake of gold by the dandelion's alchemy! I know a lady, from a mountain forest district where dandelions do not grow, who went to Asheville and saw them blooming in a hospital yard. With respect for ownership she called upon the superintendent and gravely asked his permission to collect some seeds of his dandelions. As there was no difficulty in securing his permission she carefully put her seeds in an envelope and sowed them in her garden at home. She realizes the error of her ways now, and so do her neighbors.

The orchid is a gorgeous plant, and so is the camelia. But no exotic beauties ever impressed themselves so deeply upon folk lore, popular poetry or the traditions of the people as has the peasant dandelion. The number of its names proves well how it has struck the common fancy. Our name for it is a corruption of the French *dent-delion,* which in turn was borrowed from the old Roman *Dens Leonis* or lion's tooth, so called from the jagged edges of the leaf. The German *Löwenzahn* also means lion's tooth. It has been called milk gowan on account of its milky juice, and witch gowan and yellow gowan, for "gowan" is an old Anglo-Saxon name for any daisy-like flower. Monk's head and Priest's crown and Puff ball are names derived from the appearance of the silky, fruiting aspect of the plant. The botanical title, *Taraxacum,* is thought to be an ancient Persian name for it.

As the names of the dandelion show, the plant has come to America from the Old World, where there are many kinds. There are chiefly two sorts in our own country, the common one, and the red-seeded dandelion which is more slender, with smaller sulphur yellow flowers and narrower, more deeply cut leaves. Its "down" is dirty white. This species is a newcomer to our shores, and botanists are interested in its spread inland from the coast. Have you seen it in your region?

Out West, in the Cascades and Sierra Nevadas, where the flowers are often closely similar to those of Europe, much more so than the flora of our eastern states, are some native dandelions. They are not weeds, however, and the nuisance of the family is still the common species. And what an equipment it has, both of attack and defense, to defy the thousands of children annually set to work banishing it from the family lawn!

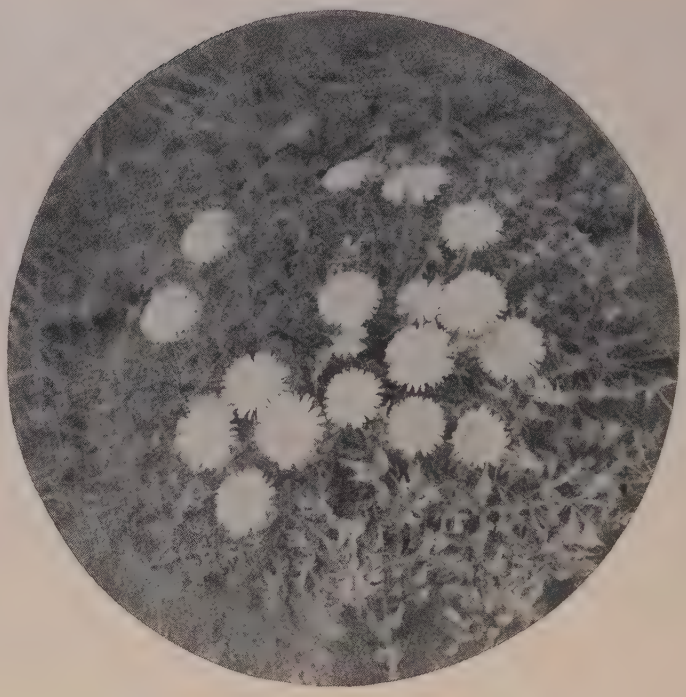
Its first weapon is its root.

PHOTOGRAPH C. R. SHOEMAKER

FOUNDER OF A LARGE FAMILY

One puff of wind will scatter the seeds and give the dandelion more than one hundred descendants.

It is a back-breaking task to uproot a dandelion, and usually some of the root breaks off in the ground, to grow again. An embittering memory of boyhood is of a crafty old maid who offered "our gang" ten cents for every dandelion we could dig up entirely from her lawn. At the end of the day she came out and inspected our wheel-barrows full of dandelions. There was not one which had whole roots. She patronizingly offered to pay each of us a nickel, but I am proud to say that everyone of us indignantly declined. To be sure, the dandelions *did* all come up again in their old places.



PHOTOGRAPH L. V. HALLOCK

BANE OF LAWN, BEAUTY OF ROADSIDE

Its basal rosette defies the lawn mower and its tough roots taunt the gatherer, so this golden tramp endures.

The bitterness of the leaves furnishes further defense. Nor are they easy browsing, growing in a rosette so close to the ground that even the sharpest lawn-mower may slip over them. But the dandelion's most remarkable resource lies in its flowers. For what is called for convenience the flower is really a city of flowers, a united community. Pull a dandelion apart and you will see it fall into between 150 and 200 individual florets of tubular form with one long, strap-shaped petal. And by that wonderful attribute known as parthenogenesis, possessed by the dandelion and some others of the composites, our world traveler is independent of the ordinary processes of fecundation which are responsible for such various forms and colors in flowers.

Thus, when the dandelion ripens, nearly all of the 200 flowers are likely to mature their seed. But if a single dandelion matured only half its seeds and only half of these survived, there would still be fifty "children." If each of these ripened only half its seeds, and only half of these matured, the "grandchildren" of the original dandelion would number 2,500!

So the dandelion is sufficient unto itself. Though bees and other insects flock to its bright blossoms, their services are not needed, for the plant produces seed by itself, and these seeds are just as viable as if they resulted from the crossing of the sexes from separate plants.

Lastly, behold the fruit and its parachute of bristles. With these sails it can voyage immense distances. No wonder that the dandelion has traveled over the whole world with a rapidity which, compared to that of most other plants, is like the speed of an express train. If you wish to fight it, frequent clipping and heavy fertilizing will make the grass grow vigorously enough to choke out even the dandelion. And besides root pulling there is the plan of cutting out the heart of the rosette and pouring in any substance poisonous to plants.

Though gardeners are its baleful enemies, the dandelion has its friends who value it. The roots are dug and sold for their medicinal use; for salads, the young, tender parts are delicious. And an old-fashioned dainty wine made from flowers is newly in fashion, in our country, at least. There are two sides to the tramp's story.

The Flying Squirrel

"IT WAS a summer evening and very quiet as I sat in the living room with the lights out, resting," writes Mrs. E. T. Gilman of Water Village, New Hampshire. "There was a sound like soft footfalls on the porch, but they remained a puzzle for the moment. The next night they came again, and I began a stealthy watch. The little thuds were none other than a flying squirrel catching flies on the screen door. But then one day my brother brought the little body, scarcely cold, for my little mystery entertainer had fallen victim to the too sure aim of some passerby."

A Baby in Need

In connection with Mrs. Gilman's little experience the accompanying picture of a baby flying squirrel is interesting. Babies separated from their mothers are raised with difficulty. They must be kept in a warm and somewhat dark place, such as a box covered with cotton. They should be fed milk from a medicine dropper every few hours. Cared for in this way, they will become tame and happy little pets.

What Do You Know About Climate

By Charles Fitzhugh Talman

PHOTOGRAPH COURTESY ALASKA R. R.

YES, THIS IS ALASKA

A land where temperatures above 90° are commoner than they are at Colon, on the Isthmus of Panama, and where the mercury has been known to mount to 100° in the shade.

A GOOD many years ago I was sent by the Government to Colon, on the Isthmus of Panama, to establish a weather station. I left Washington in July. The capital was sweltering in the worst hot spell of the summer, and its inhabitants—except those who had lived in the tropics—were telling one another that the heat was "tropical." I remember that I was an object of commiseration on the part of relatives and friends because duty compelled me to enter the equatorial regions at that season of the year. These kind people, no doubt, had the impression that, as the mercury was hovering around 100 in the shade along Pennsylvania Avenue, it must have climbed clean out of the thermometer down on the Isthmus.

I spent nine months keeping tab on Colon weather. During all that time my instruments never registered as high as 90! On one solitary occasion the temperature rose to 89.

There are, to be sure, much hotter places in the tropics than Colon, where the climate is tempered by winds from the sea. Generally speaking, however, though the so-called "torrid" zone remains warm the year round, it does not experience the extremes of heat that occur at times in summer in the misnamed "temperate" zones, especially that of the northern hemisphere. Here in the United States there are but a few small districts where the temperature does not occasionally reach or exceed 100. Near the equator there are vast areas where such temperatures are absolutely unknown.

Stranger still—from most people's point of view on the subject of climate—is the fact that some of the worst specimens of hot weather on earth are found not only outside the tropics, but a long way outside. A notorious example is furnished by Death Valley, in southeastern California. This desert valley lies about nine hundred miles north of the Tropic of Cancer, yet its summer climate is probably unsurpassed for heat throughout the world. The Weather Bureau maintains a small station on its edge, at a place called Greenland Ranch, and here—in the latitude of Norfolk, Virginia—the world's record for high air temperature was broken some years ago, with a reading of 134° F., made with a properly screened thermometer. Nominally, this record has since been beaten by a reading of 136, reported by the Italian weather station at Azizia, twenty-five miles south of the city of Tripoli, in northern Africa (also outside the tropics), but there is some doubt about the accuracy of the observations at this place. Moreover, it is believed that considerably higher temperatures occur in the low-lying interior of Death Valley than at Greenland Ranch.

That high temperatures necessarily go with low latitudes and low temperatures with high latitudes is one of the most stubborn of delusions. This

There should be year-round consolation in this article, in which Mr. Talman of the Weather Bureau tells of places that are much hotter and much colder, much drier and much wetter than wherever you may happen to be.

notion has come down to us from the ancient Greek philosophers, and it has been kept alive to a large extent by the misleading practice of using the astronomically fixed tropics and polar circles as boundaries of what are supposed to be climatic zones of the earth. It is false even in regard to average temperatures of the year, and it is conspicuously false in regard to the extreme temperatures of summer and winter. Some years ago life insurance was refused to a resident of Ketchikan, the southernmost port of Alaska, on the ground that undue risks were entailed by the severe climate of that place. The fact that the whole south coast of Alaska has much milder winters than some big cities in the northern United States is as much at variance with popular ideas about the climate of that territory as that summer temperatures well over 90 are common in its interior. People actually suffer more with heat in Alaska than they do on the Isthmus of Panama!

PHOTOGRAPH U. S. WEATHER BUREAU

WHERE THE WORLD'S HOT WEATHER RECORD WAS BROKEN

This photograph was taken at the United States Weather Bureau station at Greenland Ranch, Death Valley, California.

The explorer Stefansson has done a great deal, through his writings, to dispel exaggerated ideas concerning the rigors of Arctic climate. He declares that he has never encountered in the far north anything so bad as the blizzards that he experienced in Manitoba and North Dakota during his boyhood. The Antarctic has a worse climate, on the whole, than the Arctic, and is, as Sir Douglas Mawson tells us, the "home" of the blizzard, yet no polar explorer in either hemisphere has ever recorded such low temperatures as are registered each winter at the village of Verkhoyansk, in northern Siberia, where the Russian Government formerly sent ardent revolutionists to cool off. The official weather station at this place, which lies only one degree of latitude inside the Arctic Circle, has recorded a temperature of 90° F. below zero—the lowest natural temperature ever measured in the atmosphere, except by means of balloon soundings miles above the earth. The region around Verkhoyansk is known as the "winter cold pole." In contrast to its frigid winters, the summers of this region are often too hot for comfort. Yakutsk, in latitude 62 degrees north, has recorded 82 below zero in winter and 102 above in summer.

The principal clue to the peculiarities of climate we have mentioned is found in the distribution of land and water over the earth. The land is easily heated and cooled, while water is extremely conservative in the matter of temperature. These characteristics are communicated to the overlying air, and also, through the medium of the winds, to the air of adjacent regions. Thus the greatest extremes of temperature are found in the interiors of continents, while equable temperatures prevail on islands and coasts. Of course latitude, which determines the inclination of the sun's rays and the length of day and night, is an important factor in controlling temperature, but it is only one of several.

In respect to average temperatures for the entire year, the coldest parts of the world are the lofty interiors of Greenland and Antarctica, where, judging from the scanty observations of explorers, the averages are something like 25 degrees below zero. At the opposite end of the scale is the terrific heat of Massaua, on the Red Sea, with a mean annual temperature of 86 degrees. A somewhat higher average has lately been reported from a place called Lugh, in the interior of Italian Somaliland, but it is based on too short a series of observations to be trustworthy.

The elevation of the land exercises a great influence upon rainfall, and the rainiest places on the globe are found in mountainous regions. In the light of the latest information available there appear to be four contestants for the distinction of being the wettest spot on earth. The most celebrated of these is Cherrapunji, in the Khasi Hills of Assam, which gets its drenching from the southwest monsoon. A recent revision of the statistics for this place shows an average yearly rainfall of four hundred twenty-eight inches (nearly ten times the average for Washington, D. C.), as measured by the principal official rain-

PHOTOGRAPH DR. A. ROLLIER

WHERE SNOW AND HOT SUNSHINE GO TOGETHER

Patients at an Alpine health resort comfortably attired for the winter sports.

gauge; but some other gauges in the same locality give higher values. Another place in the same hilly district of Assam, called Manoyuram, where measurements were made for only a few years, gave the tremendous average of four hundred and ninety-nine inches a year. Unfortunately no details have been published concerning this remarkable record. The summit of Mount Waialeale, in Hawaii—nicknamed "Uncle Sam's dampest corner"—has a mean rainfall tentatively placed at more than four hundred and fifty inches. The spot is so difficult of access that measurements can be made here only about once a year—with a huge gauge designed for storing a whole year's catch—so that this figure is quite uncertain. Lastly, a rainfall averaging about four hundred and thirty-five inches occurs at sea level on the western side of Cameroon Peak, near the Gulf of Guinea, and this is supposed to indicate a much heavier fall on the upper slopes of the same mountain; perhaps the greatest in the world.

HOW HOT IS A HOT CLIMATE?

A weather station on the Isthmus of Panama where the highest temperature recorded in nine months was 89°.

No place has yet been found at which rain (or snow, in the polar regions) never falls. The driest known spot is Iquique, Chile, with an average annual rainfall of only two-tenths of an inch. At this place and others along the so-called "rainless coast" of Peru and Chile years go by without a shower, but occasionally there are torrential downpours, causing destructive floods. The Nile valley in Upper Egypt was formerly supposed to be rainless, and there are actually places there where for ten consecutive years no measurable rain has fallen, though some light sprinkles occurred. The same region is probably the sunniest in the world, while the greatest prevalence of clouds is found in certain areas on the borders of the Arctic and the Antarctic.

PHOTOGRAPH U. S. GEOLOGICAL SURVEY

A PLACE WHERE THE CLIMATE HAS CHANGED

Shore-line of Lake Bonneville, which ages ago covered a vast area that is now desert in Utah.

The word "climate" is one to which various meanings have been assigned in the past, and it is even now quite indefinite in its applications. It means literally "slope." The "climates" of the ancient Greek geographers were merely zones of latitude, corresponding to successive increases of half an hour in the length of the longest day, beginning at the equator, where the day is never more than twelve hours long. The fact that these zones differed in their atmospheric conditions was recognized, but both ancient and modern conceptions of climate have, until quite recently, been broad enough to include many things besides the state of the atmosphere. Old-fashioned medical works, for example, in describing the climate of a place, usually give information concerning the soil, the water and the prevalent diseases.

Nowadays scientific writers mean by the "climate" of a region its prevalent or characteristic weather, as known through several years' experience, with or without the aid of regular meteorological observations. The word applies to the totality of weather rather than average weather. Thus the highest and lowest temperatures that have ever occurred at a place are properly included among the data of its climate. It applies also, as a rule, only to those elements of weather that affect animal and vegetable life.

Two points about climate are, however, still fraught with uncertainty. In the first place, there are some weather elements, probably of great climatic importance, regarding which we have little accurate knowledge. One of these is sunshine. At health resorts in the high Alps invalids sit out of doors without wraps on sunny days in midwinter, when the ground is covered with snow. The air, as the thermometer shows, is intensely cold, but the sunshine, as felt by the human body exposed to it, is very warm. This difference between the temperature of the air and the heating effect of the sun's rays is ignored in nearly all statistics of climate, though it is a matter of great importance, not only in connection with human health and comfort but also in its bearing upon plant growth. Again, there are marked dif-

ferences in the quality as well as the intensity of sunshine at different places and at different times, though we have little detailed information on this subject. The richness of high-altitude sunshine in ultra-violet rays is turned to account in the "sun cure," for which such Alpine resorts as Davos and Leysin are famous. Ultra-violet radiation has seasonal fluctuations quite different from those of air temperature. Its excess in spring has been thought to account for "spring fever." Nearly everything remains to be learned about the different kinds of sunshine characteristic of different "climates," and their effects upon animals and plants. Another almost completely neglected element of climate is atmospheric electricity.

The other point of uncertainty is this: In gathering climatic information about a place, we generally assume that the climate is stable, so that the experience of past years will be a safe guide for the future. The practical uses made of climatic statistics imply this assumption, and yet, paradoxically, climatologists are continually speculating about possible changes or fluctuations of climate. Do climates change? The evidence of geology show that, in the course of ages, they have changed greatly, and there is reason to believe that even in historic times there have been rather pronounced ups and downs of temperature, rainfall and the like in many parts of the world. In some cases periods of a few warm years alternating with periods of a few cool ones, or of rainy periods alternating with dry periods may have helped foster the widespread popular belief in "changes of climate" noticeable within a human lifetime. For the most part, however, this belief is undoubtedly an illusion, arising from the process of remembering the extraordinary weather of the past and forgetting the rest. And rarely is one fully satisfied.

The Odorous Squash Bug

By Edward A. Preble

MOST persons consider all insects as bugs, and are surprised, and sometimes incredulous, if told that only one group should be so termed. These are the Hemiptera which in general are characterized mainly by having mouths which take in nourishment by sucking. Among the commonest and more conspicuous members of this group is the squash bug, which we have all seen if we have tried to raise squashes or have picked berries.

LOOK ON YOUR SQUASH VINES FOR THEM

They have few, if any, pleasing traits, not the least of their undesirable qualities being their odor.

Squash bugs have few, if any, pleasing traits. Of course, they eat the leaves of squashes and do it so well that they sometimes kill our plants. And they or their cousins also frequent raspberries and blueberries, and if we do not take care we may gather them with the fruit, and even try, by accident, to eat them. Now most of them have an odor that is among the most repellent we know of, and often by just strolling over a berry they will spoil it for our taste, and although the taste of birds is not at all like ours, most birds do not care for them either.

The full-grown squash bug in the autumn buries itself in some crevice in the earth and escapes all the unpleasantness of the winter by sleeping. In spring or early in summer the female lays from twenty to forty oval eggs in a loose group on the underside of a leaf, and in about two weeks these hatch. The young bugs are much gayer than their parents, light green about the body, with rosy legs, antennae, and heads. They grow rapidly and within a month have moulted their skins five times to keep from outgrowing them. As they grow they change in color to gray and then black, and the result is a flock of ill-smelling bugs just like their mother. Squash bugs we call them when we are pleased, and other kinds of bugs when we are otherwise, and we are glad that they are really bugs, because we mean it. Their eggs are sometimes parasitized by at least two species of minute insects, and these are our friends. The old squash bugs are not easily affected by poisonous sprays, but they like to crawl under loose boards to spend the night, and if we are early risers we can trap them there, and unless we are early risers we may as well not attempt to raise squashes in our gardens.

Wilson—Father of American Ornithology

By Witmer Stone

STUDENTS of North American birds are familiar with Wilson's Warbler, Wilson's Plover, Wilson's Phalarope and others. How many of them, we wonder, have asked who this Wilson was and why so many birds have been named after him. It is always interesting to trace out the origin of names, especially if they lead the way to history and biography, and every bird student should follow up these personal names which have come to be bird names as well and ascertain to whom they refer.

In any large library one can find a copy of Alexander Wilson's "American Ornithology," the original edition being, of course, the most interesting—a series of quarto volumes with full-page plates each containing several species, etched in outline and colored by hand, with a well-written description of each bird and an account of its life history. This work, published at Philadelphia, 1804 to 1813, was the first general treatise on the birds of the United States, and on this account its author has been termed the "father of American ornithology."

Wilson apparently began to take a serious interest in birds in 1802, and as he died in 1813, when but forty-seven years of age, it will be seen that he conceived and brought out this remarkable work in practically ten years, leaving some additional drawings and notes which were published in a posthumous volume by his friend and companion George Ord. The "Ornithology" described and figured all the birds normally occurring in the middle states with the exception of about a dozen, a remarkable achievement, to say the least. And when we learn, in addition, that the author was a poor man who had to finance the work himself and personally canvass the country for subscribers, traveling often on foot, and actuated by no motive but the advancement of science, we realize that in Alexander Wilson we have to do with an exceptional character.

Born in Paisley, Scotland, July 6, 1766, one of a large family in very poor circumstances, he was apprenticed at the age of thirteen as a weaver, having attended school only long enough to learn to read and write. Endowed with a love of Nature, and of music, poetry and literature, he, through his own exertions, supplied many of his early deficiencies; but, restless at the confinement of the loom and longing for the outdoor life, he took up the trade of a peddler and toured Scotland on foot, writing verses as he went and finally publishing a volume of poems. He also contributed poems to the newspapers, some of which, being of a personal nature, brought him face to face with libel charges and imprisonment. Upon his release, utterly despondent, he left his native country for America in 1794, locating at Philadelphia and following his trade of weaving as the only means of earning a living.

ALEXANDER WILSON (1766-1813)

It is a pleasure to inaugurate this series on the lives of naturalists with a brief biography by Witmer Stone, Curator of the Philadelphia Academy of Sciences, editor of "The Auk," past president of the American Ornithologists' Union and leading authority on the life of Alexander Wilson.

Later on, realizing the value of his literary attainments in this new and rugged country, he took up school teaching with satisfactory results, and finally, in 1802, secured a school near Gray's Ferry just outside the city of Philadelphia. Here he found himself a close neighbor of William Bartram, the botanist and general naturalist, and the friendship that grew up between them proved the turning point in Wilson's life. Bartram encouraged his budding interest in ornithology, gave him the benefit of his own knowledge, loaned him books and supported him in his proposal to publish a work of his own on the birds of America.

Wilson learned to draw expressly in order to depict the birds, having apparently had no previous instruction or practice, and his bird plates, accurate as they are in detail and superior to any produced up to that time, possess certain errors of drawing and lack the life and action of the work of Audubon and other later ornithological artists. No little credit is due in this connection to the self-sacrificing cooperation of another Scotchman, Alexander Lawson, who etched the plates from Wilson's drawings and who at the beginning of the enterprise, at least, like the author, saw but little prospect of financial

return for his labors. George Ord, one of his closest friends, has described Wilson as of middle stature and thin body; his eyes though hollow, displayed considerable vivacity and intelligence; his mien thoughtful, his features rather coarse. His walk was quick, so that it was difficult to keep pace with him, but when in pursuit of birds he was deliberate and attentive—as it were, all eyes and all ears. He was possessed of the nicest sense of honor, scrupulously just but highly generous, and his veneration for truth was exemplary He was, however, obstinate and resented criticism.

About the time he began his Ornithology he secured a position of assistant editor of Rees' Encyclopaedia, then being published by Bradford and Company of Philadelphia, and this firm naturally became his publishers. Anxious to extend his studies to the unexplored wilderness to the westward, Wilson endeavored to procure a position on Pike's expedition to the sources of the Arkansas River but without success. Apart from his canvassing trips, which, as he writes, took in all the towns within one hundred miles of the Atlantic from Maine to Georgia, he made but one extensive ornithological excursion. In 1810 he went by skiff down the Ohio from Pittsburgh to Louisville and thence on foot and horseback to New Orleans, returning by boat to Philadelphia. Unfortunately he did not touch the peninsula of Florida, where as we know today he would have found many new birds, while those of the country he did explore were practically the same with which he was familiar in the east.

Wilson's enthusiasm seemed to be shared by all his friends, and without their aid he would have had a sorry time. As it was, he suffered all sorts of privations in his efforts to get his work out, and being of a constitution which demanded plenty of outdoor exercise, the strain of attempting personally to color the plates during the heat of midsummer in the city brought on illness which caused his death on August 23, 1813.

Cut off thus prematurely, Wilson never heard the praises of his work which soon came from all over the scientific world, nor even saw the first edition completed. How much more prominent would have been his position in the history of American Ornithology had he lived to bring out the smaller "Manual" and other works that he had in mind, we cannot say. But there have been few if any influences as great as that of Wilson in developing our widespread interest in bird study, and few undertakings more unselfishly carried on, for truth and knowledge, than "American Ornithology."

Pine Cone Beetles

By A. B. Champlain

COLLECTORS of pine cones for the seed frequently find that they have been forestalled by a beetle that has ruined the seed crop in certain localities. This material reduction of pine seed is not only a monetary loss to the collector, but hinders the natural reproduction of the tree species.

These beetles, known as Conophthorus or "cone destroyers," are found to inhabit the young cones of various species of pines. There are a number of different kinds of cone beetles found in various parts of North America, all very similar in habit. In this instance the culprit is *Conophthorus coniperda* Schwarz, a species occurring in eastern North America wherever white pine grows. These cones were collected at Mont Alto, Pennsylvania, in September from beneath a large white pine from which the normal ripe cones were gathered for seed. At that time the beetles were in three stages—a few larvae or worms, the intermediate stage or pupae and some newly transformed adults.

WHAT THE PINE CONE BEETLE DOES

Deformed cones of the white pine at the right in which the beetle has been at work, and two normal cones at the left.

Adult cone beetles are small black cylindrical insects about one-eighth of an inch in length. In the spring they bore a hole into the axis of the young cones, and lay their eggs along the sides of the gallery. The worms or larvae that hatch from these eggs feed on the seeds and scales and on the interior substance of the cone, reducing it to a worthless mass of dust and frass. The worms remain in this situation until the fall when they change to the pupal stage, and then develop into adults or mature beetles. These beetles remain in the dead withered cones over the winter, ready to emerge in the spring and attack the new cone crop. Unfortunately they do not all come out at that time, a sufficient number remaining in the cones in a retarded condition until another year has passed; thus illustrating Nature's method of tiding the species over a season when the cone crop is poor. Fortunate it is that the white pine, once started, is a long lived tree with such an enemy.

Honest John Dowitcher

By William Leon Dawson

LONG-BILLED DOWITCHER AT NOONDAY REST

The author says that he takes no credit for photographic achievement with his pictures, for John is a willing camera shot.

SPORT is largely a matter of psychology, after all; and the objects of sportive pursuit are self-designated. The "Jack" Snipe, for example, has provoked pursuit by his saucy ways; and his devious course in the air, guided by the ingenuity of fear, perhaps, has, nevertheless, inspired the envious slaughter which would have disdained a less erratic object. The proof of this lies with the Dowitcher, "Honest John" Dowitcher, first cousin of Jack Snipe on the maternal side. The Dowitcher is about as large as the Jack Snipe, and its flesh is fully as sapid; but his ways are mild and his habits sociable. So it comes to pass that his annals also fall to gentler hands.

The generation of bird photographers should pass a vote of thanks to Honest John, companion of many an otherwise lonely vigil on the marshes, and willing victim of all sorts of photographic experimentation. The portraits here presented might just as easily have been increased indefinitely in number; and the writer takes no credit whatever for presenting Dowitchers instead of—say—cows.

Tide flats and the margins of sluggish lagoons, rather than beaches or upland plashes, are the favorite resorts of Dowitchers on migration. To get fairly acquainted with them, one must be willing to wade in and be "one of the boys." This mixing in involves something more, also, than a willingness to get one's feet muddy, or merely wet, as the case may be. A bird's fear of any manlike object is in direct ratio to its elevation above the horizon, and it is necessary to keep low if you would win a shore-bird's confidence. If it were possible for a photographer to wriggle over the muck, like a stranded alligator, no doubt he would get along famously. The birds would barely hop out of his path. But in default of this advantage, a feasible compromise is effected by simply humping over, like some amiable tortoise, and advancing slowly. In this way one gets something of the humble feeling which makes for sympathy with these lowly folk; and he also gets, occasionally, a backache.

Like their more sportive cousins, again, Dowitchers are industrious probers of the muck. Their movements seem deliberate enough, and one is

HONEST JOHN HIMSELF

You can sense the dogged honesty of the bird just by looking at him in this picture.

rather surprised than otherwise to find that a bird drives twenty or thirty wells in a minute. The tip of the bird's beak is enlarged slightly, flexible, and actuated, I believe, by delicate muscles, so that there is a little latitude of movement in the apprehension of prey, once the well is driven. Birds thus pleasantly employed are rather reluctant to give ground; but they may remark *quit up* by way of warning, and huddle apprehensively with their fellows. If pressed to flight, the Dowitchers establish an instant flock discipline, moving and wheeling in unison, exactly like sandpipers. Now the white parts flash in the sun, and now the dun backs of the flock are almost lost to view against the sodden vegetation. While never a demonstrative bird, there are usually a few in such a flock who feel the exhilaration of movement, and who shout *clip-r-teeo* or *cleeu-koo, koo,* in voices strangely tattler-like.

HE IS THE PHOTOGRAPHER'S DELIGHT

Tide flats and the margins of sluggish lagoons are the favorite resorts of the migrating Dowitchers.

When the tide has risen again, and muckling is over, our Dowitcher friends retire to some sunny shallow, tuck heads under wings, and sleep the dreamless sleep which comes only to honest fowl. At such a time they are the envy of yellow-legs, who suffer from insomnia, and despair of killdeers, who love to keep all alien shore-birds on the run. At such a time, also, the attendant camerist, his duty done, would fain give over his cumbersome box to a vanishing genie, draw up one foot daintily, thrust head in wing, and dream of mangrove-bordered lagoons still waiting in the southland.

Once, in autumn, just before the opening of the duck season had set the marshes aroar, I came upon a solitary Dowitcher feeding in a flooded meadow. He was sociably inclined, but the pectoral sandpipers, which pattered over the neighboring shallows, would have nothing to do with him. Honest John—I am *sure* he had done nothing naughty to deserve such outlawry—looked rather wistfully at me, and I unlimbered the picture-box *pronto.* Thereupon ensued as merry a play as ever an artful bird and a suppliant camerist engaged in. The conventional distances were lessened by acquaintance, so that before the hour was over that blessed bird was hunting harmonious settings, so that I could "take" him, with every advantage, at minimum range. Would that I had known how to reward his courtesy.

JOE JONES AND THE FRONTISPIECE

THERE is genius in the frontispiece in this month's issue of NATURE MAGAZINE, for it comes from the inspired scissors of Joe Cranstoun Jones of Augusta, Georgia. An invalid, unable to walk the woods, to delve into the intimate secrets of Nature, Joe lies in his bed and cuts silhouettes of wild life, the jungle and the chase. His sixteen years of life have never vouchsafed him the privilege of knowing Nature in fact, but his God-given talent is within and must come out.

To know Joe Jones is to love him. There comes no complaint from his lips; his cheerfulness is never-failing. The delicate tracery of his silhouettes—which he never outlines in advance but cuts directly with his scissors—have already won him fame. His work is finding a ready market and from the income he is educating himself. Even at the age of six he fashioned silhouettes without crudeness, and during one whole year when he lay on his back, strapped to his bed in the Scottish Rites Hospital in Atlanta, while those who loved him prayed for success of the treatment he was undergoing, he happily drew with his scissors.

There is a greatness to such a character transcending even the talent that is his. The members of the American Nature Association will be proud to know that he is a fellow-member and that NATURE MAGAZINE goes to him each month, perhaps giving him some suggestions; some glimpse of the world without. *Bon courage* to Joe Cranstoun Jones!

MONARCH BUTTERFLY

(*Anosia plexippus*)

Autumn days are flocking days for Monarch butterflies, as they gather to go south for the winter. In the spring they straggle back when the milkweed plant is ready to receive one or two beautiful ridged eggs, and to act as host for the zebra-striped larva, which has an acrid taste not relished by birds. The pupa, a beautiful, pale green, gold-spotted jewel, is suspended from a mat of web on the under-side of a leaf, where it gradually changes to mottled brown as the butterfly wings become visible within the thin walls. This species of butterfly has become nearly cosmopolitan because of its strength in flight and habit of migration. Flocks of countless thousands have been observed far out at sea, and along the Atlantic Coast they collect in great numbers upon slender tree branches, giving the appearance of long festoons. Its wing spread is four and one-half inches.

TIGER SWALLOW-TAIL BUTTERFLY

(*Papilio turnus*)

This is the best known of our butterflies as it flies about city parks as well as country lanes. Its shape is typical of papilios. The larva feeds on the leaves of wild cherry, mulberry and other trees, and is a curious looking creature. Spots on the thorax have the appearance of two immense eyes when the head is drawn back. Two fleshy horns just above the head, usually withdrawn, may be pushed out, and emit an odor to discourage its enemies. The pupa is attached by the tail to the side of a branch and is held upward at an angle by a girdle around the middle. The girdle is spun and so placed by the larva before the metamorphosis. The butterfly spends the winter in the pupal state and emerges in the Spring as soon as the food trees send out their leaves. The dark female form found in the southern part of the United States is the one described by Linnaeus and named *glaucus*. Its wing expanse is four inches.

GIANT CRANE-FLY

(*Holorusia rubiginosa*)

Crane-flies most often attract our attention when we find them battering themselves against a window in a frantic effort to escape. They usually fly about where there is decaying vegetation together with plenty of mud, over moist lawns and near streams, for they lay their eggs in the water, on decayed plants, or sometimes among the roots of grasses. The larvae are cylindrical, leathery, and worm-like. That of the giant crane-fly feeds on vegetable matter found in mud at the bottom of a very shallow pond. When it has grown to an inch or more in length it changes into the chrysalis state, in which it remains for about a week. It then works its way to the surface and, braced by the bristles on the posterior end of each segment, the skin splits down the back and the adult fly escapes. The wing expanse is two inches and the fragile legs are each approximately as long as this entire expanse.

DRAGON FLY

(*Anax junius*)

Hovering over marshy meadows, wings glistening in the sunlight, you may find this giant fly so unjustly called a dragon. He may be a Dragon to the insects caught in the basket made by his bowed out legs and the ventral side of his thorax, for these he eats. The female hovers over the water, and drops the tip of her abdomen just below the surface to deposit singly gelatin-coated eggs. The gelatin soon dissolves and the eggs fall to the bottom to hatch, in due time, into broad flat larvae which may be found later upon the stems of water plants waging war upon all other larvae. As they grow they shed their outer coat, wing pads appear and when the time comes for the final change, the larva crawls up on to a stem of water grass and for the last time the skin splits down the back. Out comes *Anax junius* to continue to work havoc among the pestiferous mosquitoes. The spread across the wings is four inches.

HONEY FLY OR DRONE FLY

(*Eristalis tenax*)

The Drone Flies resemble the honey bee so much that they are also known as Honey Flies. However they are real flies, having only two wings. They frequent the late summer flowers which are profuse bearers of pollen and seem to use this as their food. The most striking difference in the appearance of the two is the absence of hairs on the abdomen of the fly. The larva, known as the rat-tailed maggot, is found in the ooze at the bottom of quiet water. The tail is its breathing apparatus and it can lengthen or shorten it telescope fashion in order to reach the air at the surface of the water. When the time comes to assume the pupal form, the larva leaves the water, and at the end of about ten days the adult Honey Fly comes forth. It was originally an old world species but has become cosmopolitan. Its near relatives known as the Hover-flies are enemies of the troublesome aphis. It is one-half inch long.

ROUND HEADED KATYDID

(*Amblycorypha oblongifolia*)

One of the many species commonly known as Katydid is the oblong-winged Katydid which usually occurs on shrubbery and may be found among the flowers of Compositae, especially in damp places along fence rows and the edges of woods. The quick shuffling sound which it makes with its wing-covers, only slightly resembles the "Katydid" or "Katydidn't" of its relative the true Katydid whose home is in the tree tops. When Madam Round Headed Katydid is ready for egg laying she leaves the vegetation which she frequents and seeks a suitable place among the dead leaves on the ground, where she drills a hole with her ovipositor for the reception of each egg or cluster of eggs. After a period of time the young hatch out and spend their lives in eating and growing; moulting when their jackets become too snug for them and in due season reach maturity. It is two and one-half inches long.

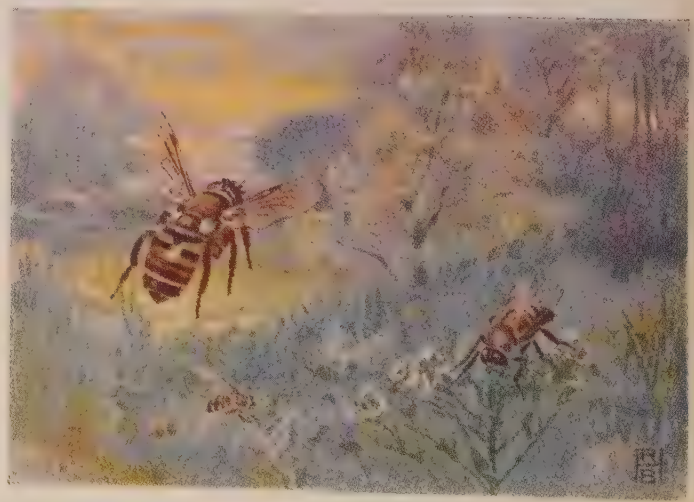
TIGER SWALLOW TAIL BUTTERFLY—*Papilio turnus*

MONARCH BUTTERFLY—*Anosia plexippus*

DRAGON FLY—*Anax junius*

GIANT CRANE FLY—*Holorusia rubiginosa*

KATYDID—*Amblycorypha oblongifolia*



DRONEFLY—*Eristalis tenax*

CECROPIA MOTH—*Samia cecropia*

LUNA MOTH—*Actias luna*

LOCUST—*Tibicen sayi*

CRICKET—*Gryllus*

PAPERHORNET—*Vespa maculata*

BUMBLEBEE—*Bombus pennsylvanicus*

LUNA MOTH

(Actias luna)

Lunas are probably our most beautiful moths. They are nocturnal, flitting about among the trees of walnut, hickory and oak, upon the upper leaf surfaces and tender twigs of which they lay their eggs. The caterpillar, when it has attained its full growth, measures three inches, and is a clear green with yellowish markings. The tubercles vary in color, and the back of the larva becomes pinkish as the time for pupation draws near. It spins a thin papery cocoon, usually between leaves, and remains hidden on the ground until time to emerge. There are two broods during the season. The early one remains only a short time in the cocoon, while the caterpillars hatched in the late summer spend the winter months in this state. The Lunas which come out in the early spring, usually, have a narrow purple border about their wings. The wing spread is four to five inches.

CECROPIA MOTH

(Samia cecropia)

This is the largest of our moths, and is found in woods and swamps in the early summer. The moths do not eat during their short life, their mission is to mate and lay their eggs upon one of a number of trees upon which the larvae may feed. When the larvae hatch out they are tiny black creatures, but after a number of moults the full-grown larva is about four inches long, bluish green in color, having six tubercles on each segment, those on the sides being blue, while the top pair are yellow. The thorax bears two pairs of red tubercles. He is rather a fearsome creature to find on a tree, but he will soon spin his large cocoon and fasten it to a branch, being careful not to include any leaves. It has a tough, leathery covering much wrinkled and is of a dull silky fawn color when finished. In this the chrysalis will spend the winter. The wing spread is five to six and one-half inches.

BLACK CRICKET

(Gryllus)

This big black cricket is to be found in many places, in the fields, about buildings in the country and sometimes in the house. He is not, however, the "Cricket on the Hearth," for that is a brown English species. Our black crickets hop or walk about rapidly and are omnivorous feeders. At birth the young closely resemble the adult. Eggs are laid in holes in the ground made by the sharp-pointed ovipositors. If these are laid in the fall, the young do not hatch until the following year, but those laid earlier hatch into individuals which spend the winter as almost mature nymphs. There is an ear cavity in each front leg. The song is produced by the rapid rubbing of the file on the under side of one wing-cover on the roughened upper surface of the other, and may be heard for a long distance. The males are the musicians of the family. The size varies with age but the adult is an inch or more in length.

CICADA, LOCUST

(Tibicen sayi)

This insect which is commonly called a locust is really a cicada. Only the male sings. The music box is to be found within the anterior segments of the abdomen. It is only during the warm part of the day that he favors us with his strident song. The eggs are laid in the tender tips of tree branches, where they hatch out and soon the larvae fall to the ground. Several years are spent in the ground, sucking juices from the tender tree rootlets. The forelegs become strong and are used for digging the way through the earth. Toward the end of larval life rudiments of wings appear and grow until time for emergence. It then digs its way to the surface of the ground, crawls upon the stem of a plant or on a tree trunk, splits its skin and allows the adult to come out. Only two or three weeks of life is his after this final change. The wing spread is approximately three inches.

BUMBLE-BEE

(Bombus pennsylvanicus)

Intermediate between the honey-storing and the solitary bees, come the bumble-bees, which live in small colonies. The community consists of males, females and workers. The home is usually in some deserted mouse nest or similar place filled with fibrous material within which the queen builds a platform of pollen moistened with honey and there lays about a dozen eggs, over which she constructs a dome of wax. Near this she places a cell which she fills with honey to use as food while she incubates her eggs. The young grow to adult form in about twenty-two days. The first bees to hatch are workers, which soon begin to help in the care of the colony. The life of the community comes to an end with the summer and the future of the species depends upon the young females, which hibernate through the winter. The pollenating of the red clover depends upon bumble-bees. No bumble-bees, no clover.

PAPER HORNET, BALD-FACED HORNET

(Vespa maculata)

The paper hornet is one of our efficient fly-traps. When the fly is caught Vespa hangs by her hind legs, nips off the wings and carries the body home to the babies. Young queens hibernate and in the spring start new colonies. A suitable place for a nest is selected and there the queen glues a half-inch stem of waterproof paper made of wood pulp and saliva. The lower end of this stem is widened into a hollow ball with a hole at the bottom to serve as a door. Within, suspended from the roof, she makes an inverted saucer-shaped comb and in each paper cell places an egg. When the first brood is hatched, they enlarge the nest and add new floors, while the queen stays indoors and lays eggs. Late in the season she lays eggs which will become males and queens. The workers also care for the colony by carrying food to the new members during their growing period. The hornet is approximately an inch long.

Love-Apples and Nightshade

By Leslie L. Haskin

YEARS ago a little boy—a *very* little boy—was helping his mother as she gathered tomatoes in the garden. As they worked together the boy listened with delight to the mother as she talked of flowers and growing plants. Finally she picked a spray of ripe tomatoes from one of the plants that bore small, cherry-like fruit.

"Are these not pretty, and don't they smell rich and sweet?" she said. "When I was a little girl we grew tomatoes like these in our flower gardens, for ornament, and called them love-apples. We thought that they were poisonous, and never imagined that they were good to eat. I remember very well my first taste of a tomato, and how scared I was for hours after eating it, for fear that after all it would prove to be poisonous and I might suddenly die."

The little boy listened to his mother's whimsical account with wide-eyed interest and laughed to think that anyone had ever considered tomatoes dangerous.

As they were leaving the garden the mother picked a tomato blossom, and then, as they passed along the rows of vegetables, she also picked a potato blossom, and one from an egg-plant. Then she showed the boy how all these flowers were formed on a like plan, and had their stamens surrounding the pistil to make a pretty, curious beak-like point.

"These all belong to the same family," she said. "We call it the *Solanaceae,* or Nightshade, family."

Still carrying the three kinds of flowers, she then led the way to the barnyard and showed him wild plants growing there with flowers having the same peculiar form, and bearing small, black berries.

"This is the really poisonous member of the family," she said. "You must never touch these berries, for they are the deadly black nightshade—*Solanum nigrum.*"

The little boy always remembered that first lesson in botany.

Once the mother of the boy was ill, and a young girl, a stranger in the neighborhood, came to help about the house.

"It is time that the people knew the truth about the black nightshade," writes Mr. Haskin, "just as our grandmothers learned about the 'deadly' love-apples that grew on the tomato vine."

Mr. Haskin is quite right, and although Nature Magazine *does not wish to encroach upon the field covered by Mrs. Farmer's justly famous cook book, we present here two recipes that Mr. Haskin and the "girl" send as a part of his entertaining article.*

Nightshade Pie

Carefully clean fully ripe fruit: To each pint, add two tablespoons full of vinegar, and one cup sugar. Fill crust, and cook as for other fruit.

Nightshade Jam

Clean and cook fruit: When almost done, add to each pint of fruit two cups full of sugar, and three tablespoons full of vinegar. Cook a trifle longer, and seal in jars or glasses.

When this girl went with the boy to the barn to gather eggs, she noticed the plants with shining black berries.

"Where I used to work they made awfully good pies out of those berries," she said.

"Oh, no!" corrected the boy, "those are the poisonous nightshade. It must have been something else that looked like them. Those will kill you if you eat them," and he gave her a lecture on the deadly qualities of *Solanum nigrum*.

The hired girl was much abashed to think that she had made such a mistake.

"Anyway, they looked just like it," she said, "and they had those pretty yellow points in the center of the flowers."

As the boy grew older—following in his mother's steps—he learned more and more about plants, but especially was he interested in the black nightshade, for the hired girl's description had left him wondering. Moreover, he could not help noticing, when he handled the ripe nightshade berries, how rich and sweet they smelled. It was not alone his mother's warning that made him beware of them, however, for as he studied in books he found, everywhere, the same warning. Then, at last, he found in a new book this statement:

"The fully ripe berries have been an article of diet with the Indians, who appear to survive afterward." That made two witnesses for the nightshade—the hired girl and the Indians.

For several years the boy could find nothing further on the nightshade question save the continual warning and caution in the books. Then another new volume came into his hands, and this time what he read was as follows:

"In the Dakotas . . . this plant is known as the stubbleberry, and the fruit is much used for pies and preserves."

Now the hired girl, he remembered, had come from Dakota, so here was what is called corroborative evidence—evidence supporting evidence, and very convincing. Unfortunately, Dakota was a long way off; moreover, other interests were just then crowding out the thoughts of nightshade, and of botany in general. For one thing, there was a girl; for by this time the boy was grown—a girl with black hair, and black eyes, eyes blacker than nightshade berries, and much, much brighter. In the general stress of trying to get those black eyes to look kindly upon him, he somehow overlooked the fact that the girl herself was from Dakota. Finally, however, they were safely married and settled in a home of their own. Then one morning at breakfast the black-eyed girl remarked casually that she wished she had some Dakota blueberries for her garden.

"And what, pray," asked the boy, "are Dakota blueberries?"

"Why," said the girl, "they are what you call—ah—nightshade."

That brought the boy to attention with a snap, and in answer to his question he found that, in her own words, the Dakota girl had been raised, so far as fruit was concerned, on the berries of

THE DEADLY LOVE-APPLES

Quite right, they are nothing more or less than tomatoes, but to our grandmothers they were poison, or so they thought.

SOLANUM NIGRUM OR NIGHTSHADE

They will make the delicious looking pie pictured on the first page of this article if the recipe is followed.

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Solanum nigrum, the deadly black nightshade. The result of the diet, as he viewed it across the table, fully satisfied all other questions.

Not long after this the boy had a fine, thrifty row of nightshade growing in his garden, and when he had given the fruit a thorough test, he sent for his mother.

"Mother," he said, as she was seated at the table, "do you remember how you told me about eating tomatoes for the first time, and showed me the resemblance between tomatoes and nightshade? Now I want you to help me in ending another superstition. This pie is made from nightshade berries. The 'girl' and I are going to eat it. After you have seen that it does us no harm, we want you to eat some too."

"My boy," said the mother, "I taught you to observe Nature carefully, and not to report anything that you had not proved to be true." Helping herself to a generous piece of the pie, she continued: "If you say that nightshade is good to eat, and I am poisoned, it will serve you right for not paying better attention to your mother's teaching."

When she had finished the pie she deliberately wiped her lips. "It's delicious!" she said; "to think what I've been missing all these years. Why didn't I know enough to try it at the time that I ate my first tomato?"

Diplodocus, an Amphibious Dinosaur

By C. W. Gilmore

Curator of Vertebrate Paleontology, U. S. National Museum

NEARLY every group of animals has its giants, those that tower high above their fellows, but nowhere is this fact more strikingly brought home to us than among that race of extinct reptiles known as dinosaurs, some of which were by far the largest land animals the world has ever known, exceeded in bulk only by the modern whales.

One of these giants, though not the largest, is known by the scientific name of Diplodocus (*Di-plod-ō-cus*), and unfortunately for those who shy at scientific terms, this animal has never acquired a popular name, unless the term "Dippy" may be regarded as such. *Diplodocus* as shown by a mounted skeleton in the Carnegie Museum in Pittsburgh, Pa., reached a length of eighty-seven feet measured from tip to tip, and stands over fourteen feet high at the hips. Aside from its great length, the other outstanding characteristics of this animal are the small head, giraffe-like neck, elephantine body and long tail with slender, whip-like extremity. Its great length is roughly subdivided among the different parts as follows: Head two feet, neck twenty feet, body fifteen feet, and tail fifty feet. No, not exactly a pet for the home!

DIPLODOCUS NEVER HAD A POPULAR NAME

Perhaps "Dippy" would suffice for this prehistoric and lengthy denizen of age-gone lakes and water courses.

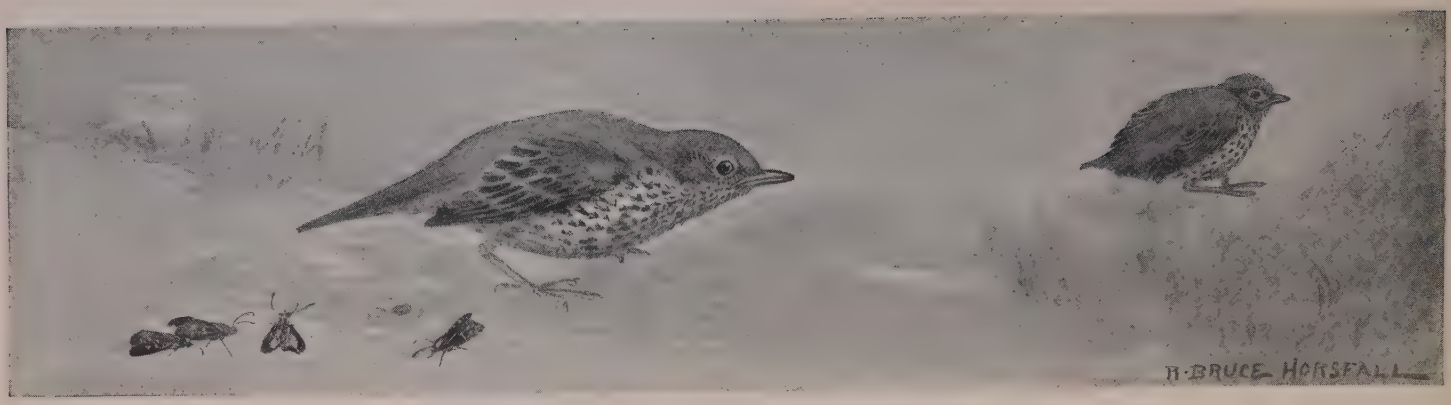
The teeth show the animal to have been a vegetarian. These were pointed, pencil-like both in size and shape, and confined entirely to the front of the mouth and of little or no use in masticating their food. It is thought they were useful to *Diplodocus* only as prehensile organs in detaching and gathering up the soft aquatic plants that probably grew in great abundance along the shores of the lakes and water courses in which these animals are supposed to have lived.

One of the perplexing problems of fossil physiology yet to be solved is: How did such a small head, provided so poorly with teeth, suffice to provide food for such a big animal? Lucas in his *Animals of the Past* points out that an elephant weighing five tons eats one hundred pounds of hay and twenty-five pounds of grain for his day's ration but would require twice this weight of green food. On this basis a fifteen-ton *Diplodocus* would devour something over seven hundred pounds of plants each day, provided his appetite was similar to that of the elephant. But since there is no reason for supposing these reptiles behaved unlike those living today, we must remember that alligators, turtles and snakes often go for weeks, even months, without any food whatsoever, and so it might have been that *Diplodocus* did not require so much nourishment as his great bulk would lead one to imagine.

It is not improbable, as pointed out by Hatcher in his monographic study of this animal, that during the period that *Diplodocus* lived over what is now Wyoming, Colorado, Utah, Montana, and the Dakotas, the physical conditions were not unlike those that exist today in tropical America, especially in the lower Amazon and Matto Grosso with their numerous lakes, bayous and rivers surrounded by a tropical vegetation. Here, in the midst of a moist tropical climate, *Diplodocus* in the companionship of many other kinds of dinosaurs, both large and small, lived and flourished some ten million years ago.

The idea had been advanced by some authorities that on account of the great weight of *Diplodocus* he was unable to walk on the land and that all of his time was spent in the waters as a wading animal, the weight of the body being buoyed up by the water. In the light of the recent discovery that dinosaurs lay eggs, it would seem that *Diplodocus* must at least have come ashore long enough to deposit them.

From the extremely small size of the brain it seems reasonable to infer that *Diplodocus* was a harmless, stupid sort of creature not to be feared except he might step on one.



"BETWEEN HER YOUNG HOPEFUL AND TEMPTATION"

HARMONIES OF NATURE—TASTE

By H. W. Shepheard-Walwyn

TASTE is a faculty that plays a far larger part in the scheme of animal life than might appear on the surface. Even in the case of human beings, the sense of taste can exercise an influence that is by no means always realized. A good mother—good digestion—or, say, good teeth—are not the only factors in one's daily life which are seldom appreciated until they have been lost. Has it ever occurred to you to imagine an existence in which everything you ate or drank would taste nasty instead of nice, a condition in which discord, rather than harmony, would characterize every morsel that passed your lips? And yet—is there any logical reason why it should not have been ordained this way, just as much as the other? Life itself is more often bitter than sweet.

Generally speaking, we are so used to taking things for granted, that we seldom realize the importance of such a function as this in our daily lives until some calamity occurs to drive it home—a few days in bed with the influenza-fiend, for instance, when fish or chicken taste like sawdust and pudding like cotton-wool, when even a chocolate caramel would have about the same effect upon the palate as a blob of mud.

You may notice an unconscious tribute to the value of this function in the fact that it can at times be developed even to the point of a fine art. A good many years ago, I happened to meet in a railway train a dapper little man who was employed as a professional "taster" by a well-known firm of tea merchants. Judging from the purely aesthetic point of view, the wretched fellow must have lived in a kind of perpetual purgatory—what with being forbidden to eat this, and not allowed to drink that, for fear of dulling the amazingly purified sense of taste that was necessary for the fulfillment of his duties. All the same, he might have done worse. It did enable that neat little man, without any particular exertion, to maintain a neat little home at Putney, with a neat little lawn surrounded by neat little trees, under which he could recline on sweltering Sunday afternoons, and drink neat—*water!*

A milder form of this development appears in the cases of fastidiousness that one often meets with—people who simply refuse to drink tea with sugar, for instance, or simply refuse to drink it without; I know a temperamental artist whom nothing will induce to eat a boiled egg unless laid the same day, another who only enjoys one properly when it has what is called a "taste" to it—while I could name more than one highly respectable citizen who swears that he would rather do three years' penal servitude than eat the fat on a mutton-chop.

Amongst the lower animals this attribute is considerably less prominent—except in certain instances where civilization has made its influence felt. Race-horses are proverbially "difficult" with their food, while your prize Persian, or pampered Pekinese, will usually turn up its nose at fare which the yard-dog or roof-cat would devour with relish. With certain reservations, it is the habit of birds, animals and insects to eat what their several instincts direct. The more surprising, therefore, that in one of the very lowest grades of animal life this attribute should appear in an aggravated form.

I refer to the humble caterpillar. There is quite a common delusion that any kind of caterpillar will eat any kind of leaf. While true enough in a few instances, it is the general rule among caterpillars to refuse even to taste a leaf that has not been included in the menu prescribed for them by their godfathers and their godmothers. Take the case of that remarkable creature, the "Puss" moth. The caterpillar of this species will touch nothing but the leaves of poplar and willow. Coax him as you will, even try starving him into subjection—so rigid the discipline of his inherent instinct, that the obstinate beast will actually allow himself to die before consenting even to sample any other kind of leaf.

A very striking instance of one man's meat being another's poison, is provided in the case of that popular favorite, the peacock butterfly. One item, and one alone, figures upon the bill of fare patronized by the caterpillar of this beautiful creature. Now, you, who have ever tasted the young shoots of stinging-nettles, nicely cooked and rubbed through a sieve, will agree to its being a dish worthy to set upon kings' tables—but anyone might be excused for jibing at the idea of eating nettles raw. The peacock caterpillar, however, seems to be proof against stings inside as well as outside. In battalions of several thousand strong, you may behold them bivouacking amongst some colony of nettles, systematically working through the whole plantation in massed formation, until in course of time the place will look as though one of the plagues of Egypt had swept over it. Another caterpillar, that would starve before deserting his

beloved nettles, is the famous "woolly bear"—so reminiscent of those queer old Victorian times when children were children, and the woolly bear frequently held the place in their hearts which the Teddy bear now occupies, when the schoolboy was a schoolboy, and loved to pay off old scores upon an unpopular master by collecting a tinful of these hairy, swift-footed little rascals on the last day of term and turning them loose in his desk!

So much for the caterpillar. On arriving at butterfly's estate, the question of taste does not appear to interest her greatly. The butterfly is not what you would describe as a greedy sort of creature. She lives a singularly blameless life. If true that the butterfly toils not, neither does she spin, no less true is it that she spoils not, neither does she sin—by no means her wings alone that entitle her to rank amongst the angels. The more staggering, perhaps, on that account will be the shock that I have in store for you.

"As rising on her purple wing, the insect queen of Eastern Spring . . ." sang the immortal Byron himself. But—alas!—it was descending, rather than rising, on her purple wing, that I once came upon a certain insect queen of English spring—midsummer, to be strictly accurate—in a sequestered corner of her forest kingdom. Draughts of nectar awaited her royal pleasure on every hand, temptingly displayed in chalices of crystal, ruby, amethyst or gold, distilling for her enticement the fragrance of Araby or Edom.

"THE BUTTERFLY LEADS A SINGULARLY BLAMELESS LIFE"

A shimmer of purple caught my eye the moment that I reached the spot where she had disappeared, over the edge of a rough cart-track—otherwise I should probably never have noticed the body of a dead weasel in an advanced state of decomposition. . . . Her mate was there before her, his glorious purple pinions all a'quiver with unholy ecstasy, as he sat feasting upon that filthy piece of carrion. . . . So completely absorbed in his degrading occupation, that I had no difficulty in picking him up between my finger and thumb—this, if you please, the shyest, and the swiftest flier, of all our British butterflies!

Now there is also the objective side of the question to be taken into account—the question, that is, of the effect that any particular creature will produce upon the sense of taste in others. A very serious consideration, too, when the question of life or death may hang upon one's ability to create an impression of discord, rather than harmony, in the perceptive faculties of one's enemies—you can understand that a moth tasting of bitter aloes, or a caterpillar with a strong flavor of quinine, would hardly prove a popular article of diet in feathered circles! May I waft you for a moment to a wild, fragrant slope among the Surrey Downs, where tall mauve scabiouses stand like sentinels among the red-gold tufts of bird's-foot trefoil and splashes of purple milkwort, where rambling rock-rose runs riot over the sun-baked ridges, while clematis and bryony play hide-and-seek amongst the dogwood and wild guelder that crown the summit of the hill?

To wander this way towards the end of June is to find that a new miracle is holding the enchanted realm in thrall. For the Burnet moth has come into his kingdom. Scores of them—hundreds of them—thousands of them, lazily swinging on the fragrant blossoms—so startling the study in contrasts afforded by their plumage of metallic blue-green and vivid crimson, that it might almost be a shower of jeweled trinkets, rubies set in green enamel, and mysteriously imbued with powers of feeble flight, dropped upon us from Olympus to liven things up a bit. The amazing part is that such conspicuous objects are even allowed to exist for one single instant by the crowds of birds chattering together among the

surrounding bushes. No art required for their capture—the veriest simpleton of a half-baked fledgeling could shovel down those fat green bodies as fast as shelling peas. Surely there must be a catch somewhere?

With the object of discovering that catch somewhere, I took a box of these moths home one day, and released them under the nose of a young thrush, that I found sitting with a lost expression in the middle of a garden path. If Master Squawker suspected no catch somewhere, however, his watchful mama in a bush hard by, evidently had very decided views on the subject. In the twinkling of an eye she had placed herself between her young hopeful and the first real temptation of his little life—and at the next she was chivying him down the path in so pointed a manner that no further demonstration was required on my account. Another example of a creature that tastes extremely unpleasant is the caterpillar of the brilliant "Cinnabar" moth. Try one of these velvety black and gold crawlers on a party of young cockerels. Being utter greenhorns, they will go for it like a team of footballers—but oh! the spitting and the sputtering and agonized grimaces which follow the first taste. Next time you offer them one, they will look pointedly the other way.

And now for a brief mention of how this very important question applies in the kingdom of Flora. Remember that trees and plants breathe through their foliage, so that in some cases at least it will make a stupendous difference to them whether they happen to taste nice or nasty to the rest of the community. Life must be a precarious sort of business when one is permanently tied by the leg in a position where any passing animal can snap off portions of one's lungs at its own sweet will. A remarkable object lesson in Nature's method of exploiting this principle is provided by a certain plot of ground where my Japanese Deer are enclosed. Originally a patch of densely clothed woodland, the place presented the appearance of a Flanders battlefield by the time that these voracious quadrupeds had been in residence a few years. Then—all of a sudden—a lone speck of green appeared in the heart of the desert. "By the lord Harry, a seedling!" How long would it be before the deer noticed it? They noticed it at once—and like the cockerels with the cinnabar caterpillar—pointedly looked the other way.

That speck of green developed into a substantial rosette, then shot up a tall spire of crimson bells—and still those usually greedy animals religiously looked the other way. In due season our foxglove reared a mighty brood, and, once the ball had been set rolling, a sprightly primrose followed suit; then came a cheery company of cowslips and staked out claims all over the place; next a party of stalwart burdocks—and nowadays those deer must have got quite a crick in the neck from always having to look the other way! What can be the explanation?

One can understand that a tough, leathery leaf like that of the burdock, or say a mullein, might not prove much to their taste—but what is the matter with the gentle primrose? And what is wrong with that veritable poem of charm and fragrance, the cowslip? As for the foxglove—just try one of these leaves on a horse or a cow! Try it on a sheep or a rabbit, try it even on a donkey or a goat, and, bearing in mind the riddle of the Burnet moth, and the conundrum of the cinnabar caterpillar, it will be evident that Nature requires no teaching how to make use of Discord, no less than Harmony, in Taste, for the protection of those who cannot otherwise protect themselves. Yes, Nature can teach us much.

The Table-Mountain Pine

By S. S. Dickey

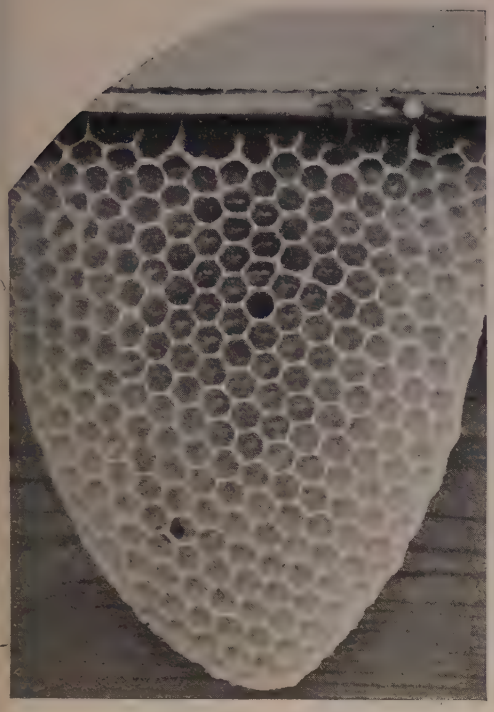
THE TABLE-MOUNTAIN PINE, *Pinus pungens,* is one of the most striking members of the evergreen tribe. Certainly it cannot be termed a common tree, because it favors far off upland solitudes, where, on the verge of some sterile hog-back ridge, it rounds out its obscure yet nevertheless interesting days.

This pine is remarkable in the fact that its conspicuous cones are well protected by a host of stout barbules. One who makes a special journey to observe the enchantment of the tree sees both old and new cones, clustered around the branches, adding to the entire plant an aspect of versatility and vigor.

On the far off flanks of Spruce Knob in Pendleton County, West Virginia, the highest peak between the Adirondacks and Virginia, the table-mountain pine graces the beetling walls of quartzite rock which jut out of the sky-blue waters of the Potomac. There in the crannies, where the turkey vulture hides her nest, the more or less emaciated pines eke out a living from the disintegrating earthy substance. One looks over the rippling river and sees them silhouetted against the deep verdure of the red spruce belt that sweeps across the summit of the lofty range.

Michaux, the French naturalist, is responsible for the name of this pine. He is said to have found it in extensive colonies on escarpments of the Appalachian ranges in Carolina and Tennessee. One realizes, as he looks on the surpassing beauty of *Pinus pungens,* that it must have thrilled the wanderer from across the sea.

There are favored spots on Tusseys' Mountain in central Pennsylvania where the table-mountain pine forms thickets of moderate height, ensconced on the verges of the rolling uplands that sweep on and on until they are lost in the purple haze of the distant Juniata gorges, that lure one to come and to know.



A NEW COMB APPEARS

Within a few hours the colonizing bees will build new cells filled with honey from the old home.

How doth the busy little bee? Few better authorities could be asked this question than Mr. Pellett, who has devoted most of his life to this busy insect. He is a naturalist, and widely known as a writer on bees. Mr. Pellett was graduated in law and practiced for two years, but the farm and bees called him. He served five years as State Apiarist of Iowa

The Honeybee

By FRANK C. PELLETT

(PHOTOGRAPHS BY THE AUTHOR)

THE ROYAL APARTMENTS

The queen bees are reared in special cells that are about the size and the general shape of a peanut.

FOR THOUSANDS of years the bee has been celebrated in song and story. Perhaps more has been written about it than any single member of Nature's great and wonderful family. Despite these many words and although many questioning individuals have chosen to spend their idle moments beside the hive, there are still many honeybee mysteries that remain to be unraveled.

Those who study the honeybee inevitably become enthusiasts crediting it with marvelous traits. While it is highly specialized and many things in its life history and habits are surprising, it is unnecessary to use superlatives in describing it. Many things in Nature are wonderful if we look closely enough.

The thing which, perhaps, has attracted most widespread comment is the government of the community where many thousands of individuals live together in apparent harmony and where each individual labors for the good of all. Men have looked in vain for the sources of direction of the colony activities. As far as it is possible to see, each individual bee assigns her own task. Apparently each bee passes through certain well-defined stages in which she performs in turn each of the important labors of the hive. First we find her nursing the young bees, building combs, cleaning the hive and such other work as must be done at home. When she is older she goes afield to bring in stores of nectar and pollen. Such activities, however, may be greatly varied under the stress of unusual circumstances.

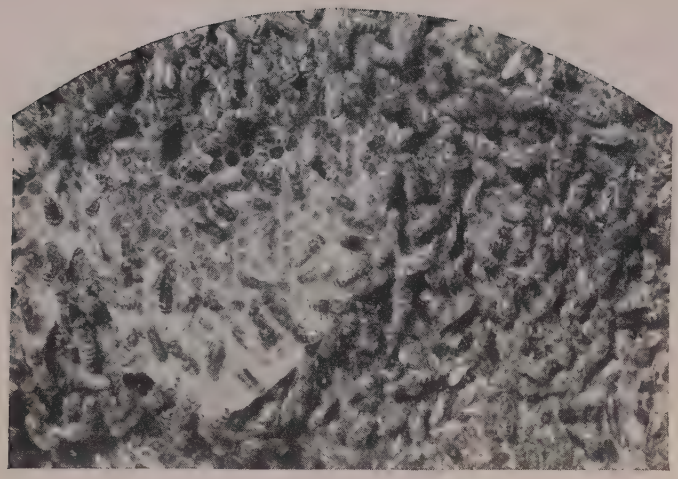
Let us take a look within the hive and see what is going on there. If we look closely, we shall see one individual which differs in appearance from all the rest. This is the queen, or, more properly, the mother-bee, who lays the eggs from which the numerous occupants of the hive are produced. She is longer and more slender than the numerous bees which surround her, apparently giving her the most assiduous attention. She takes little notice of the group of attendants except to stop for a moment at frequent intervals to accept food. Since she lays hundreds of eggs daily, often a total of more than her own weight, she must consume an amazing amount of food. Her attendants, in order to make this food quickly available, take the coarse pollen together with the honey into their own stomachs and partially digest it, regurgitating it for her as she will take it.

In a normal colony there will be only one queen, which is a perfectly developed female, while there will be thousands of worker bees, which are also females but with special characteristics which enable them to do certain highly specialized work. It is one of the unsolved puzzles of Nature as to just what takes place to change the developing insect and make it so different from the sister who may be growing up in the adjoining cell. Apparently there is no difference in the egg from which a worker develops and the one which may produce a queen, except the conditions under which it is incubated. The worker is reared in an ordinary cell similar to the ones in which honey is stored. The queen is reared in a specially

PHOTOGRAPH AMERICAN MUSEUM OF NATURAL HISTORY

THREE MEMBERS OF THE HIVE FAMILY

Female or queen, neuter or worker, and male or drone, in the order named.



AND THEY SAY "BUSY AS A BEAVER"

Here is a group of newly hived bees losing no time building combs, and beginning their production.

when they are no longer of service, and a worker bee which has spent her life in storing honey for the good of the community either leaves the hive or is dragged out to die alone when she becomes disabled and can no longer contribute anything in the way of useful labor. The life of the individual is entirely submerged in that of the community. She gives all and takes only enough to supply her immediate needs. No matter how much honey may already be stored in the hive, the bees go to the field and work feverishly to pile up more when any is to be found. Man has taken advantage of this trait and has constructed hives suited to his own purpose. The good beekeeper takes care to leave an abundance of stores to supply the needs of the bees so that they lose nothing from his taking of their surplus store.

During the active season the life of a worker bee is short. If there is a good honeyflow and colony activities are at their height, it is probable that the average worker will not live more than six or eight weeks. Nature makes no provision for replacement of worn tissue, as she does with man, so when the bee's organs become damaged they cannot be repaired, and she dies. The most apparent injury to the working bees is the wearing of the wings so that they can no longer fly. Bees which emerge in late autumn when field work is over find their duties less arduous, and they may live over winter to begin the activities of the following season, thus having a life of several months.

When the young queen is from five to seven days old she leaves the hive on her mating flight. She is

built cell, somewhat resembling a peanut in shape and size. The larva which will produce a queen is fed on a richer food, called, by the beekeeper, royal jelly.

The mature queen is a very different creature from her worker sister, however. The queen will rarely leave the hive but will occupy her life in the laying of eggs to replenish the population of the hive. The worker will be occupied in bringing in stores and feeding and caring for the thousands of young bees. It is easy to see the need of different tools for the two, but it is hard to figure out how they get them.

THE BEE COMMUNITY AT TOWN MEETING

As soon as they are hived they form in large clusters in preparation for comb building.

The queen lacks the wax secreting organs of the worker, she has no pollen baskets as does the worker, her eyes are not nearly so well developed as those of her sister who will go to the fields, while her sexual organs are fully developed and the worker's are not.

The drone, or male bee, has little to do with the activities of the colony. He is tolerated during a part of the year through necessity, for his only contribution is to the perpetuation of the race. At the close of summer, when no more honey is coming from the fields, brood rearing ceases. When there are no more young queens to be mated the drones are driven from the hive to perish from cold or hunger. They are helpless fellows who never gather any food for themselves but depend upon their industrious sisters to feed them.

The honeybee community has often been held up as a model for human government. It should be noted, however, that the community, so highly praised, has no care for the individual. No provision is made for the care of the old, the maimed or the useless. The drones are driven out to die

THANK YOU, BUSY BEE

The luscious product of the bee's endeavors ready for the consumer's table, and his sweet tooth.

immediately pursued by a number of drones. Since the mating takes place in the air, she is likely to meet the strongest and swiftest of the males, and thus Nature provides for the elimination of the unfit. Once the queen begins to lay, she is not likely to again leave the hive except with a swarm, for her single mating will serve during the period of her life.

There is a fascination about beekeeping not common to other pursuits. During the honey harvest, when the bees are working feverishly or when they are swarming, something of their excitement is conveyed to the beekeeper. Swarming day is the one grand holiday in the life of a bee. On that day the old home is left behind, and the old working force, with the old queen, go out to found a new community, leaving the old one to the young bees which have recently emerged from their cells.

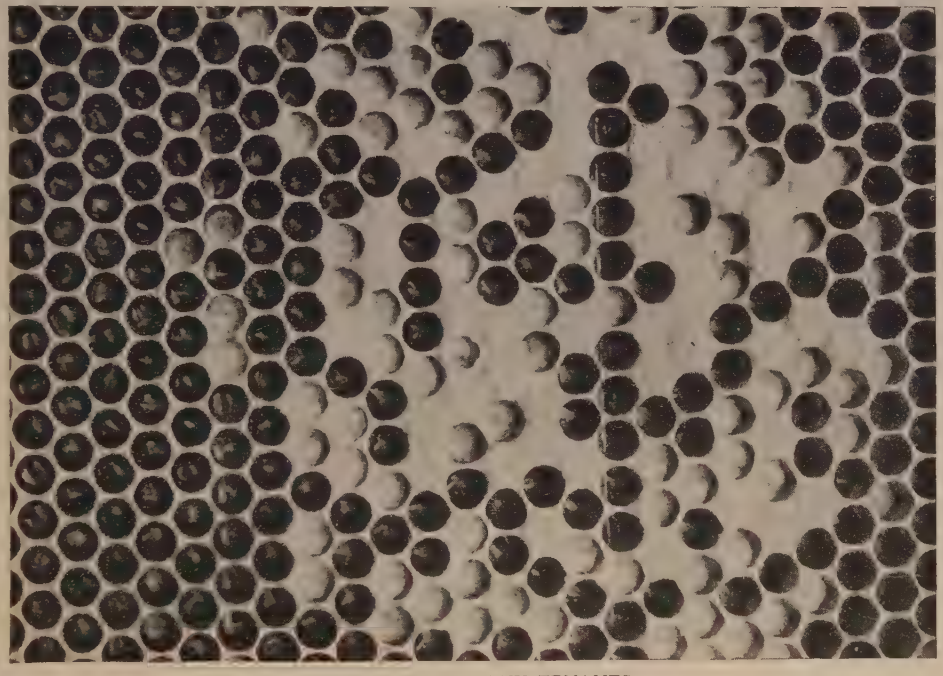
IN CONVENTION ASSEMBLED

Swarm of bees clustered on a young apple tree on swarming day, the national holiday in beedom.

Many a time have I stood beside a hive and watched the issue of a swarm and wondered what sort of signal could be responsible for their sudden start. One moment all would be as usual, the field workers would be coming in with their loads of yellow pollen. Others would be departing for the fields as though with no thought other than laying up stores. A quiet humming, such as always is to be heard when the bees are ripening honey, could plainly be heard. Suddenly there would be a new note—a note of excitement. Bees would come tumbling out of the hive in such haste as to crowd each other and fall from the alighting board. More and more, faster and faster, until the opening of the hive would not be large enough for them to pass. At the edge of the alighting board they would take wing and begin circling about.

The queen may be among the first to leave the hive, or she may be among the last. There are even times when she does not come out at all, and after flying about for a few minutes the bees discover her absence and return to the hive. In such cases they soon settle down to work again as usual for a short time. Within a few hours, or perhaps a day or two later, they are likely to come out again in the same manner.

Before leaving the hive each bee fills her honey-sac with honey from the cells to provide the colony with a supply with which to start the new home. After flying about in the air for a short time, they alight in a cluster on some convenient object, which often proves to be very inconvenient for the beekeeper who would place them in a hive. If undisturbed, they may remain clustered for a day or more before they depart for the new location. Swarming bees seem to lose all memory of the old home and remain contentedly in the new situation in which they find themselves for the moment.



A COMB WITH MANY TENANTS

Look closely and you will see the eggs and young bees in the cells, but at home, not in prison.

As soon as they are hived they form in large clusters in preparation for comb building. Within a few hours combs will appear as if by magic, and the cells will be found to contain a portion of the honey brought from the old hive. Wax is a product of the bee's digestion. On the under side of the abdomen there are what are called wax plates. When the bees cluster together they are able to generate a considerable amount of heat. Having first gorged themselves with honey, this condition is favorable to wax production and scales of wax soon begin to appear. These are placed skilfully one against another in the building of the comb.

In order to profit from their labor the beekeeper supplies frames containing sheets of foundation made of pure beeswax. When these frames are filled with combs the beekeeper can remove them from the hive at will without damage. When the bees have become established he adds another compartment to the hive, called a super, containing smaller frames which also contain sheets of wax in which they place the surplus honey. When these pound sections are removed they contain the finished product of the hive, ready for the consumer's table. And what consumer is there who will not, in the eating, pay full tribute to the busy bee?

Some Interesting Things to Look for in July

By E. Laurence Palmer

THOSE who worry about the "forwardness" of the new generation might well keep their eyes shut in July, for it is in that month that the new generation of birds, frogs, mammals, garden weeds and other forms of animal and plant life begin to come into their own. Frogs and toads leave the pond of their infancy and launch themselves with all the confidence in the world into the unknown land outside. Birds leave their nests and take risks that no self-respecting adult would think of taking. Young mammals of many sorts show no sense in the familiarities they permit from visiting humans and so the story goes.

While this condition of affairs may make the mortality rate for these various creatures exceptionally high it permits of many exceptional observations on the part of Nature lovers. It is during these weeks that the bird-banding enthusiasts are able to band whole families of young birds in a few minutes. It is during these weeks that the amateur photographer can reach into a nest and line up a whole family of young birds, perch them in a row on a stick or stump and then press the bulb of his camera to his heart's content. To be sure he should use judgment in the matter and not undertake such a task so early that the parent birds may desert the nest and leave the young to starve.

THE GOLDFINCH

July like almost any other month of the year has representatives of the seasons that precede it and of those that succeed it. Some of the flowers, like the early goldenrods, take on a distinctly autumn atmosphere. Some of the trees begin to change the color of at least a few of their leaves before the end of the month even though those leaves may be leaves growing on injured twigs.

Among the birds whose habits remind us of the bird activities of June are the goldfinches, which are among the very latest birds to begin nesting. There may be many reasons for this but among them is the fact that goldfinches feed their young on food of a considerably different nature than that used by other birds. Watch a few of the birds of July that are feeding their young and see if you can form some generalization as to what is the commonest article of diet for the commoner small birds. Then locate a goldfinch—this isn't generally difficult—and see if it uses the same type of food as the others. If you cannot locate a goldfinch try to find out if all the birds of your vicinity feed their young upon essentially the same kind of food. The manner in which the parent birds feed their young and the manner in which they induce the young to leave the nest all offer interesting things for you to look for in July. Also notice if there seems to be any difference in the ability of young birds to hang onto a perch immediately after leaving the nest. Is there anything, for example, on the inside of a robin's nest which will give a young robin a chance to practice grasping branches before leaving a nest? Is this same thing true for any other birds you may care to choose?

A CODLING MOTH DAMAGED APPLE

Cats may justly come in for considerable criticism during July. In New York State we have a law which makes it the duty of any game protector or peace officer and the privilege of any person of age who owns a hunting license to destroy any cat found "hunting or killing any bird protected by law or with a dead bird of any species protected by law in its possession; and no action for damages shall be maintained for such killing." It might be worth while for interested Nature students to start collecting definite data on the number of birds killed by different local cats. It might be interesting mental exercise to determine the relative guilt of a small boy who kills a useful bird with a gun given him by his elders and an adult who willingly harbors a cat which is known to kill large numbers of such birds. Owners of dogs which kill sheep are held legally responsible for the acts of their dogs and might offer any readers of this section another attractive angle on the situation. The behavior of a bird-killing cat is always an interesting thing to watch in the season when young birds are so plentiful as they are in July. Would that more people would have the opportunity of watching such cats providing this would not necessitate the

A CAT AT WORK

increase in the number of cats. For the birds' sake at least do what you can to keep cats in the house, particularly at night, when they have an unfair advantage over the birds.

Possibly the robin's nest that you may have been watching was in an apple tree. If so you may have other worth-while things to watch besides the birds or the cats. The apple tree may be burdened with apples, some of them with three or four on a fruit spur. Select a part of the tree and remove the small apples so that on one part of the tree no fruit spur bears more than two apples. Leave the rest of the tree to nature and see which part of the tree produces the better fruit. Also you will find that developing apples offer interesting serial studies. An insect may injure a young apple early in July. See if you can determine how long the injury remains and later in the season see if you can identify other apples that have been similarly injured. There are plenty of people who can look at an apple in the fall and say with fair confidence that it was visited in or about July by a certain kind of insect. It is worth while for these people to be able to do this for any number of reasons.

THE CICADA RESTS

THE BUSY TADPOLE

Somehow we get the idea that trees don't begin to shed their leaves until fall. Look around on the ground under your apple trees and see what you think of the matter.

Take a trip to the woodlot in July and let your mind picture for you that same woodlot as it appeared in May. Are there as many flowers in bloom on the ground under the trees now as there were then?

Along some damp shady place you may find some jewel weed with their attractive flowers hung in a most peculiar manner. Determine if possible by watching insects visit these flowers why these flowers are suspended as they are. If you have never done it before press a good plump jewel weed fruit gently between your fingers. You may get a surprise in addition to some knowledge concerning the peculiar method these plants adopt for spreading their seeds.

By July many insects will have reached maturity. Of course mature insects may be found during any month of the year but it is certain that whether the July crop of newbloods who have just become of age are in the majority or in the minority they certainly make more noise about it than did most of the insects of the earlier part of the year. Grasshoppers and crickets may be heard in the low plants calling to their mates or for any mate whether it is theirs or not. Cicadas may be voicing whatever sentiment they may have from the treetops and mosquitoes and deer-flies may be making us voice sentiments not uttered in the presence of those whom we desire to please. If you have never watched any one of these insects closely enough to find out how it made its noise you may have something interesting in store for you. Let me suggest, however, that it may be more pleasant to confine your investigations to grasshoppers and crickets than to mosquitoes and deer-flies. How, for example, does a grasshopper make the noise it makes?

The tadpoles of a large number of frogs and toads may reach maturity during late July and transform into diminutive frogs or toads depending upon the kind of tadpole concerned. Of course you all know that the tadpoles do not shed their tails and that the toads and frogs do not come down in the rain, but do you know, for example, how long it takes a leopard frog tadpole to absorb its tail and transform into the frog form? Does it take a few hours, a few days, a few weeks or a few months?

THE JEWEL WEED

Many of the frogs and toads that come out onto terra firma find their lives filled with more terror and their hold on life certainly no firmer. The weeds near the pond may abound with snakes, birds, and mammals that like nothing better than a young frog or toad. Some of these snakes may be themselves starting a new generation on its way during this month. In the snakes, for example, there are a number of interesting things to watch for. I have had red-bellied snakes, garter snakes and green snakes start a new generation on its way in glass cages on my office desk. Some of these gave birth to living young and some laid eggs. Do you know which did which or if you don't happen to know these snakes, could you answer the same question for any of the snakes you find in your rambles?

During July the nature of the sunsets may begin to change from what they were earlier in the season. You may also find that the sun does not set behind the same tree or house on the western horizon each night. Does it choose a place consistently further north on the horizon, consistently further south or does the direction of variation followed at the beginning of the month differ from that followed at the end of the month? Does it set directly in the west at any time in this month?

People living in the northern states have considerably more daylight during these months than those in the south. As we go north, the days in summer grow longer and longer, until at the poles, the spring, summer and early autumn are one long day. Have you ever thought how this has helped the explorers, most of whose work must be done in summer?

A Lesson in Education

By Richard W. Westwood

HIS NAME is Miles A. Smith, an eighteen-year-old senior at the Cardington, Ohio, high school with a burning urge to follow in the footsteps of Greeley and Dana, Stone and Pulitzer. He had already chosen the Fourth Estate, field of hard work, disappointments and endless satisfaction, for his life endeavor. For the *Marion Star*, the late President Harding's newspaper, he was the Cardington correspondent, supplying plenty of copy for the suburban editor's desk.

There came one day, however, a big assignment. There were many other reporters on the same story—thousands of them. But Miles "scooped" them all and sold his story for the equivalent of four thousand dollars, or about eight dollars the written word, a pretty fair space rate for any writer.

The assignment was to write an essay of not more than five hundred words on the subject of Forest Conservation. Martin L. Davey, Member of Congress from the Fourteenth Ohio District and an active leader in the conservation field, was the "managing editor" who gave the original assignment. Mrs. W. W. Milar of Akron, State Chairman of Conservation for the Ohio Federation of Women's Clubs, was the efficient "city editor" who oversaw the covering of the story.

There is a distinct suggestion contained in this article about the Forest Conservation essay contest conducted in the high schools of Ohio under the auspices of the State Federation of Women's Clubs for the Davey Scholarship. The plan of organization itself is indicative of what may be done elsewhere in the same or other fields in the way of public education. The interest that was aroused in Ohio was tremendous and the possibilities of such a program were not really fully realized even by those who had the vision to arrange it.

One day Mr. Davey decided that he would make conservation one of the live topics of the moment in Ohio. How to do it? Public education, of course; harness the boundless energy of youth! So Mr. Davey decided to give a four-thousand-dollar scholarship to the Ohio high school student who would write the best essay on Forest Conservation. Mrs. Milar immediately saw the possibilities of such a contest, and the executive board of the Federation of Women's Clubs saw it also.

What such a contest means in point of education, scope and organization is extremely interesting and suggestive to anyone thinking of a similar campaign in the same or any other field. Four thousand contestants entered the lists. Twice that number of parents became immediately interested, not alone in the efforts of their children but in conservation. Thousands of other close relatives and friends were also interested.

But to handle such a contest? There are thirteen hundred public high schools in Ohio and one hundred and fifty parochial high schools. In every one the contest was announced, and this must have reached nearly three-quarters of a million young people. In many of the schools the writing of the essay was made a part of the regular school work. Only a few of the best were formally entered in the contest.

In each one of the eighty-eight counties of Ohio there were three judges. In each of eight districts there were three more, and there were five state judges. In all two hundred and ninety-three people prepared themselves to sit in judgment in the contest. The women's clubs emphasized the subject, and the newspapers carried much material to help the contestants.

The four thousand youngsters turned out a good two million words and devoured volumes and pamphlets of information in preparation.

The essays were first passed upon by the county judges, who forwarded the three best essays to the district judges. The three best in each of these were then passed on to the state judges. The contest closed on the first of January, and the scholarship was formally awarded to the winner by unanimous opinion at the annual meeting of the State Federation at Springfield during the week of May 10.

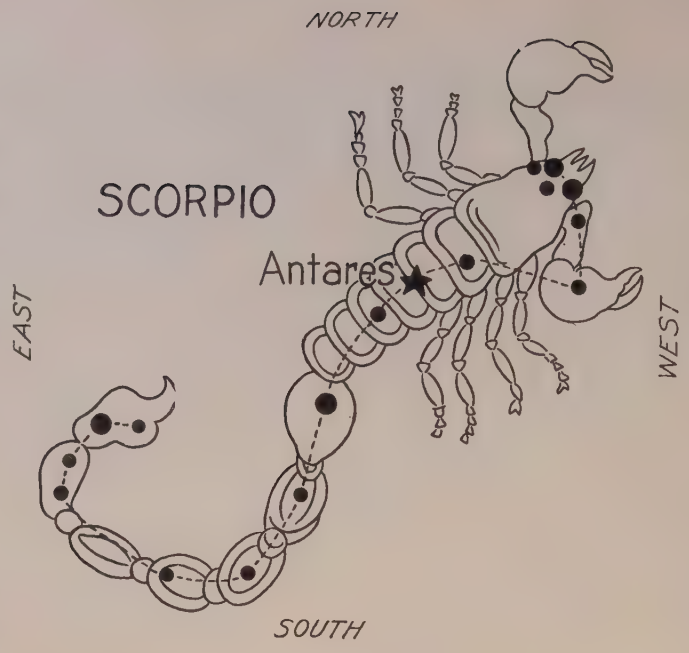
The only way to learn to write is to write and write and write, we have been told. Miles Smith took this to heart. He spent two months in writing his essay, rewriting it eleven times before he was satisfied. And in the fall he is going to Ohio State University on his scholarship of one thousand dollars each year for four years. You have one guess as to what he is going to specialize in. Quite right; it is Journalism.

"After the Federation accepted my offer of the scholarship, I stepped out of the picture," says Mr. Davey. I had nothing to do with the campaign. The Federation assumed complete charge and Mrs. Milar became the active manager. For a time she was commander-in-chief of an army of thousands of persons. It was a gigantic task, and it was well done. I think that the Ohio Federation of Women's Clubs is deserving of the highest praise that can be given for the vision, spirit, energy and thoroughness manifested in an undertaking of such magnitude. The way they worked was an inspiration."

Every Girl Scout a tree planter is the plan of Mrs. Jane Deeter Rippin, National Director, who is planting some of the first trees in the reforestation plan under way at Camp Andree near Briarcliff Manor above New York City. This summer the "Forestry Primer" is being studied at the training camps for scout leaders. This publication of the American Tree Association, marking 1926 the semi-centennial of forestry, has been sent in quantities to every training camp. In this way the leaders will be able to take the forestry message home with them to the troop members.

SCORPIO IS ONE OF THE FINEST CONSTELLATIONS

There are many fascinating legends about Scorpio in the annals of mythology.



SCORPIO IS A CONSTELLATION OF GREAT ANTIQUITY

It is reputed to have stung the toes of Orion when he was boasting.

SCORPIO AND THE JULY SKIES

By Isabel M. Lewis

SCORPIO is one of the finest constellations in the heavens, and it is also one of great antiquity, dating back to a period long before the Christian Era. It is said to have been one of the original six zodiacal constellations. It originally included the stars that now belong to Libra, The Scales, next to it on the west. The Scorpion, so it was said, contracted his claws to make room for this new group. Scorpio is seen at its best in the tropics and south of the equator where it appears high in the heavens. In our latitude the brilliant stars in the tail of The Scorpion lie so close to the southern horizon that we lose much of their splendor in the haze of the atmosphere.

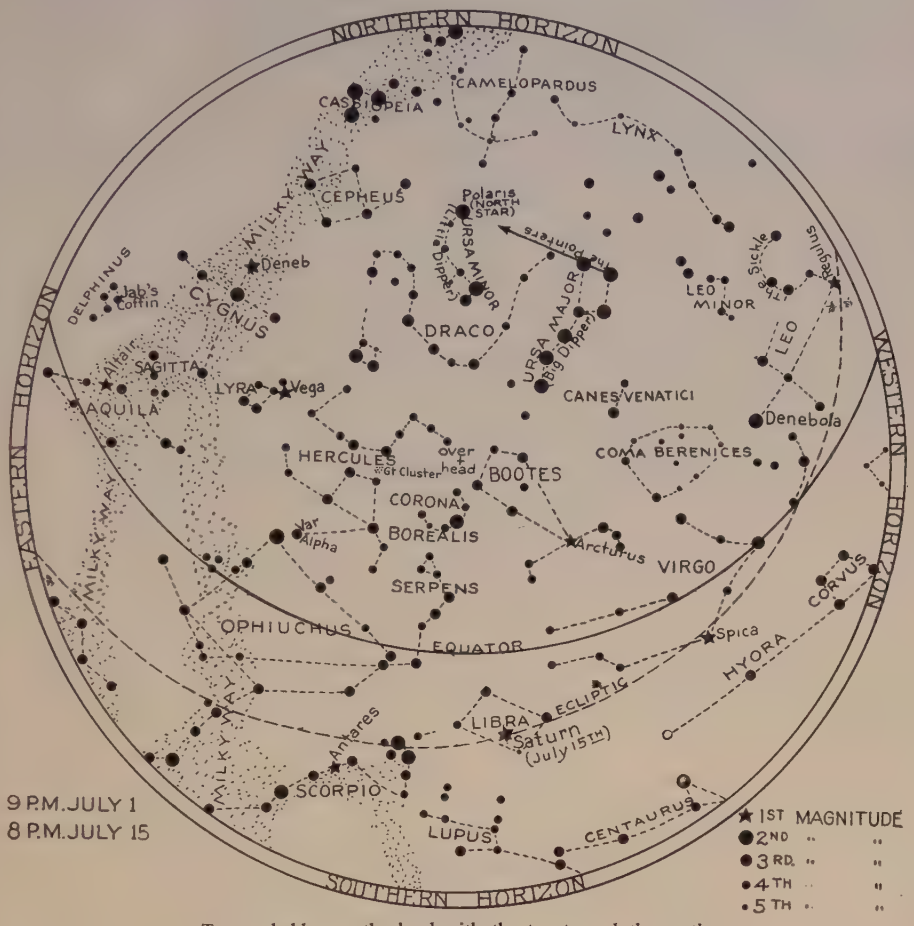
There are several interesting legends about Scorpio. Some have it that he stung the toes of Orion when he was boasting that he could slay all the creatures of earth. At any rate it is certain that Orion disappears below the western horizon when the Scorpion appears in the east. According to another legend, of special interest to small boys, Phaëton, the son of Phœbos Apollo, begged his father to allow him to drive the fiery steeds attached to the chariot of the sun on one of their daily trips across the heavens. Finally, Apollo yielded to the boy's entreaties and Phaëton, holding the reins with inexperienced hands, started across the heavens. All went well until The Scorpion crossed their path waving his huge claws. The steeds, becoming terrified, reared and plunged and dashed so close to the earth in their flight that the clouds dissolved and the mountains began to smoke with the heat. Then the mighty Jupiter, seeing what was taking place, cast a thunderbolt at the frightened boy that hurled him into the great Eridanus, the River of the Sky. And there his close friend Cygnus, changed to a swan, is still seeking for him.

Though there are many brilliant stars in Scorpio the finest of them all is the fiery red, first magnitude star, Antares, in the heart of the Scorpion. Antares means Rival of Mars, and indeed, occasionally, it is difficult to tell the two apart. At times Mars passes through the constellation of Scorpio as it is one of the twelve groups of the zodiac that mark the path of sun, moon and planets through the heavens. So it may pass very close to Antares, and if Mars is then far from the earth so that it appears less brilliant than usual, the resemblance between star and planet is very striking. In the telescope all resemblance disappears. Mars, being a planet, then shows a disk, like the moon, while Antares because of its great distance still remains a point of light, as do all the stars when viewed through the telescope. Antares is actually, however, the largest of all the stars in size so far as is known. It has a diameter of about four hundred million miles, and if it were put in place of the sun at the center of the solar system, it would extend far beyond the orbit of Mars and the planets Mercury, Venus, Earth and Mars would lie beneath its surface. Antares is so far away that light, traveling 186,000 miles a second, takes over a century to pass from Antares to the earth and we see it not as it is now but as it was over a century ago.

Saturn is still the only planet visible in the evening at

There will be a special event in the skies on the ninth of July, when an annular eclipse of the sun takes place. This will be visible as a small partial eclipse of the sun in the United States to the south and west of a line passing from British Columbia to Georgia. Near this line which marks the northern limit of the eclipse, it will be so small that it will scarcely be seen unless one is looking particularly for it. Only a tenth of the sun's diameter will be covered by the moon at most places in this country. The greatest partial eclipse will occur in the southwestern states. At Pasadena, California, one-third of the sun's diameter will be covered at the time of greatest eclipse, which will take place there at 4:25 p. m., Pacific Time. In the southern states the eclipse will occur late in the afternoon.

the time for which the July chart is given. It will be readily found in the constellation of Libra in the southern sky, appearing as a brilliant yellowish star to the west of Antares in Scorpio and east of the diamond-like Spica in Virgo. Jupiter will come into view in the southeast later in the evening, however. This magnificent planet is now in Aquarius and, next to Venus, is always the most brilliant object in the sky, except on the rare occasions when Mars surpasses it temporarily in brightness at close approaches to the earth. It will be visible in the southern heavens this month from late evening until dawn.



To use hold over the head with the top toward the north.

Mercury may possibly be picked up in the evening twilight a little to the north of west during the first two weeks in July as it reaches its greatest eastern elongation—that is, greatest distance east of the sun—on July 10 when it is in its most favorable position for observation. It is a surprisingly brilliant little object quite the equal of the glorious Vega. Mars is continuing to approach the earth and increase in brightness. No star in the heavens now surpasses it in brightness with the exception of Canopus and Sirius and, among the planets, Venus and Jupiter. On the eighth of July it will be found due south at sunrise, a magnificent object in the eastern sky from midnight to dawn. Its distance from the earth on July 15 will be about 83,600,000 miles. Venus is still a fine Morning Star, outshining all other stellar objects, and is now in the constellation of Taurus.

An annular eclipse such as that on July 9 is one in which the moon fails to completely hide the sun from view along the line of greatest eclipse so that a ring or annulus of light remains visible at time of greatest eclipse within the path of the annulus. During this eclipse the path of the annulus will cross the mid-Pacific, touching only a few small islands northwest of the Hawaiian group. At Honolulu there will be a very large, partial eclipse near midday, 88 per cent of the sun's diameter being covered by the moon at greatest eclipse. Partial eclipses will also occur in the East Indies, the Philippines, Eastern Asia, Japan, and in Mexico and part of Central America.

The Devil's Slobber in Uruguay

By Eva Mary Marsh

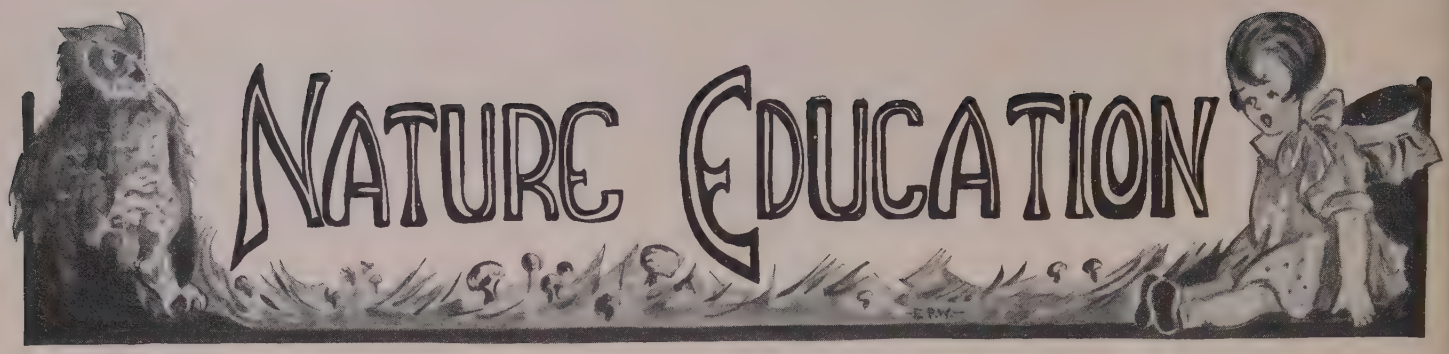
ONE DECEMBER afternoon I went for a ramble on the Rambla Presidente Wilson in Montevideo, Uruguay, a fashionable and magnificent promenade, the "board walk" of South America's greatest summer resort.

It was a warm, balmy afternoon of the early summer of the southern hemisphere. But the joy of the day and the contentment of the strollers, though not the beauty and interest of the scene, were slightly marred by innumerable particles of a web-, gauze-, or silken-like substance that streamed through the air on a light breeze across the bay from the east to the west toward the Argentine. It tickled the faces and clung to the hair of the strollers.

Perhaps you will at once recognize the floating particles as the silky filaments of the gossamer spider, otherwise known as the flying spider, aeronautic spider, or ballooning spider, which in this case could well be called the "arriving summer" instead of *Der fliegende sommer* of the Germans.

Again, on a beautiful afternoon some days later, I went to bathe at the beach by the Rambla; and to my great surprise and interest I saw a larger movement of myriads of these spiders from the west to the east. The air was filled with gauzy balls, webs, and filaments. There had recently been heavy rains and winds, or "pamperos," in the Argentine; and these sprightly little black spiders had either been blown violently away from their moorings and on a long journey over land and sea, or they had instinctively taken advantage of a breeze to seek a quieter and drier land.

The early and approximate dates, the contrary routes, and the opposite directions of these concerted movements—be they migrations, dispersions, or otherwise—inspired a few observers to a further study of this interesting and mysterious little spider that makes long aerial voyages over the vast continent of South America. But the majority of the observers, who were only passingly interested and annoyed, brushed away with visible dislike that which is vulgarly known as the *Baba del Diablo*, or the devil's slobber.



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Girl Scout World Camp

The most thrilling and important event in the history of Girl Scouting in this country, to quote *The Girl Scout Leader,* took place in May when the World Camp of Girl Scout and Girl Guide Leaders was held at the Edith Macy Training Camp for Girl Scout Leaders. Leaders in our own country were hostesses to leaders from Europe, Asia, Africa, and South America. It is interesting in this connection to note that Nature and Forestry courses form an important part of the program of the Girl Scout National Training Schools for the summer of 1926.

* * *

Nature Study Assemblies

The assembly period, in which educators are constantly seeing new values, is well used by Ellen Eddy Shaw, Curator of Elementary Instruction in the Brooklyn Botanic Garden for teaching Nature Study. Upon invitation from any school in Brooklyn, Miss Shaw attends its assembly and speaks to the children on any Nature topic of especial interest to them. To the public school classes which go to the garden for instruction a printed list of subjects for talks is given. The class fills in a card, supplied for the purpose, with the title of the talk desired, and in response an illustrated talk or demonstration is given them in the assembly room of the Botanic Garden. Still another series of assemblies is held for the children who come for greenhouse or outdoor work on Saturdays. These assembly programs cover such subjects as "Spring Flowers," "The School Garden and Its Care," "How Nature Disperses Seeds," "Methods of Bulb Planting" and the like.

WHO'S WHO IN NATURE STUDY

William G. Vinal

In response to a brief questionnaire sent recently to Nature leaders in various places, Prof. Vinal gives the following brief account of his work in Nature Study:

"I think that my interest in Nature Study must have been caught from my mother. She had the reputation of always being able to make plants grow. She always had the windows filled with potted ferns, which must have been difficult when we were limited to a wood fire. My parents not only allowed but encouraged me to have pets. These early experiences undoubtedly had a great deal to do with my interest. I think my technical training at the Bridgewater Normal School was the source of Nature methods. Much of my inspiration there came from Prof. A. C. Boyden, who is now the principal.

My first position, which was limited strictly to Nature Study, was at the Rhode Island College of Education. I have given a great deal of time to the training of Nature counsellors and to Nature work in Scouting. At present I am at the New York State College of Forestry. Part of my work consists of Extension Lectures. My Saturday Nature Class meets from 9.00 a. m. to 1.00 p. m. It is entirely out-of-doors and oftentimes is continued through the day. At such times we cook our meals in the open.

"I think possibly my most interesting experience was while guiding in the Yosemite National Park.

"On Tuesday evenings I have a Boy Scout Leadership Course. The university is giving credit for this work. This morning, March 31, I am starting out for Briarcliffe Manor to do some Nature work for the Camp Leadership Course given by Teachers' College. The following week I will be at the Palisades Park at Bear Mountain to instruct the playground leaders in Nature work on the playground. I am also to be two weeks at the Edith Macy Training School for Girl Scout leaders. This is a very interesting part of my work at Syracuse University."

Prof. Vinal is well known as a lecturer. His illustrated Nature talks cover a broad range of topics.

* * *

A School Museum

The collecting instinct is being put to educational use by the science department of the Okmulgee High School. A zoological museum, which will be the best of its kind in the Michigan high schools, is the goal of the young collectors, who have already many hundreds of birds, reptiles and insects for their collection. Miss Torce, who is in charge of the department, has secured the help of leading authorities in identifying and classifying the specimens.

* * *

Newspaper Helps Teachers

An increasing amount of Nature Study material useful for teachers is appearing in the *Sierra News,* which goes to 27,000 school teachers in California.

Before Mr. Show became District Forester in the California District he conducted an exhaustive investigation of the effects of forest fires in the California pine forests. This article is revealing in character and its fundamental lessons are not limited to California or one section of the country.

To the left is pictured a stand of primeval forest which will produce from forty to sixty thousand board feet an acre, enough to build ten or fifteen small houses. So the match carelessly thrown aside, the campfire neglected is a threat against the homes of several families. Think it over!

CHECKING UP ON THE FOREST FIRE

By Stuart Bevier Show

(PHOTOGRAPHS COURTESY U. S. FOREST SERVICE)

SAYS Hill-Billy Jim, "These foresters that try to tell you fire hurts our forests don't know what they're talking about. Now I've lived in the mountains all my life, and so did my dad, and I tell you they're wrong. We always have had fires, and look at that fine forest over on the ridge. Can't beat it anywhere. Why, the Indians knew what to do; they set out fire each year. They were the original foresters. And we learned from the Indians.

"That was why we had those nice open forests in pioneer days. Look at the forests now. Full of brush and trash. You can't travel in them any more. The more brush, the worse fires will be. And bugs come in and kill the big trees. That's what you get from these new notions."

An emphatic challenge, that. Phrased more or less elegantly, it still is heard up and down the Sierra and Coast Ranges of California. Is our mountain-dwelling friend right? Is "Piute forestry" adapted to the needs of civilized man? What does fire do, anyhow? Is fire an enemy when wood is in the form of lumber and a friend when in a tree? Let's see if modern scientific investigation can answer these leading questions.

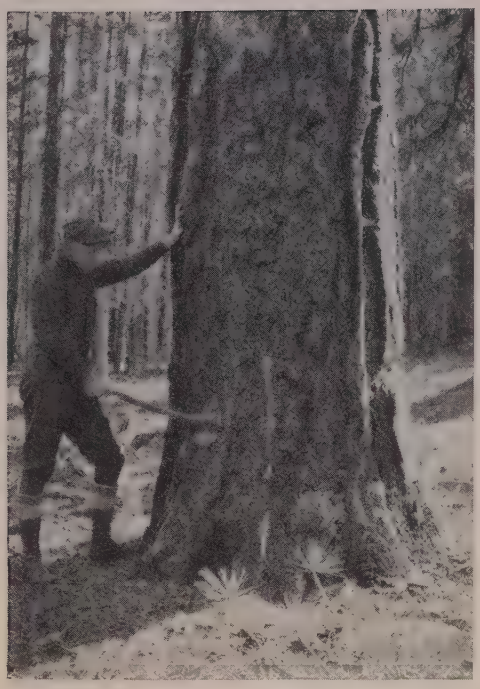
The first thing proved is that fires have run in our forests in past centuries. We do not depend on the testimony of oldest inhabitants in reaching this conclusion. Nor do we go to the chronicles of explorers. Instead we go to the forests themselves. Basal fire scars, big and little, shallow and deep, mark an enormous number of veterans in the virgin forest. When fire runs through the timber today it leaves its mark. It has done the same in the past.

We can tell not only that there have been ancient fires, but we can determine the year in which they ran. Trees have the urge to persist. When scarred, a new layer of wood—an annual ring—begins to creep out to cover the wound. Year after year this scar tissue forms. Even centuries after the burn, by cutting across the tree, we can count back the number of years of wood overlying the scar. Thus the year of the fire is recorded.

Many of the trees in the virgin forest

A PROTECTED YOUNG FOREST

Although but seventy years old it has produced forty thousand feet an acre with fire protection.



APPARENTLY QUITE WELL

The bark of a sturdy tree that looks to be in the best of health.

are two or three centuries old. A few have endured for four centuries. By piecing together the records on fire scars on thousands of trees, we find that since at least the year 1685, fires have run through the forests repeatedly. The average interval between fires has been eight years. Thus some of the veteran trees have endured probably forty or fifty fires.

So far, the outspoken advocate of burning is right. Fires have been common in the past.

Whether all this burning can justly be saddled on to the Indian is open to question. Lightning caused many forest fires in bygone days as it does now. Probably the Red man, either deliberately or through carelessness, was responsible for many fires. But, after all, it is a matter of small importance.

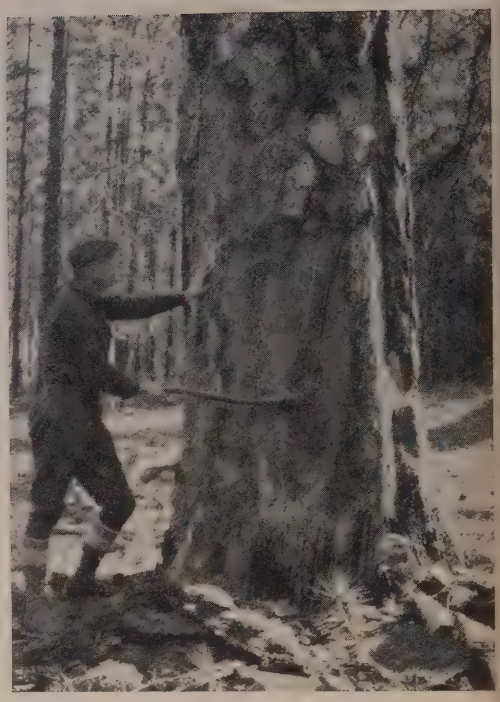
The important thing is that today we require wood—lots of it. Our valley agriculture depends on maintaining a forest cover in the mountains so that erosion and floods may be minimized. These things were not in the picture for the Indian, whose use of his environment was less intensive.

The "Indian forester" myth—for it is largely a myth—may be seen in its true light by extolling the virtues of the medicine man. Few sensible people, if seriously ill, would call in such a healer. It is just as ridiculous to solve our forest problems by arguing from a past civilization.

But a more direct question is raised when we find forests—splendid ones, too—persisting through centuries of repeated fires. The presumption, at first glance, is that fire may, after all, be a good thing.

The forester, with a thirst for accurate information, has put his measuring stick on the primeval forest. He finds that the best—not the average—of the two hundred and fifty - year - old growth scales from forty to sixty thousand board feet an acre. That's a lot of wood—enough to build ten or fifteen small houses. If he stopped there, it would be an impressive picture.

But he wants a comparison. So the same measure is applied to sixty-year second growth forests, differing from the virgin timber only in age and in the fact that *fires have not run through them.* Here he finds a scale of forty to sixty thousand board feet an acre.



BUT SEE THE SCAR!

It lurks beneath the bark, a legacy of an ancient fire burn.

Astonishing, yet true, that with fire protection, a given crop of wood is produced in one-fourth the number of years required by the often-burned virgin forest.

Now we begin to see fire in its true rôle—that of a destroyer. Even where the virgin forest persisted, it is a poorer forest than if fire had been kept out.

If now we seek an explanation of the how and why of fire damage, present-day fires must be examined. Each fire, even a light one, starts in where the last fire left off. A favorite point of attack is the old fire-scar legacy of ancient burns. Gradually it is eaten deeper, until the tree, deprived of support, falls. This inconspicuous process of burning down, slowly but surely, thins the forest of its oldest, largest and most valuable trees.

When a pine or fir or cedar tree drops out, room is available. Immediately a struggle begins to occupy that space. Tiny seedlings of the forest trees come in, but along with them come brush species such as

A YOUTHFUL TIMBER GROWTH

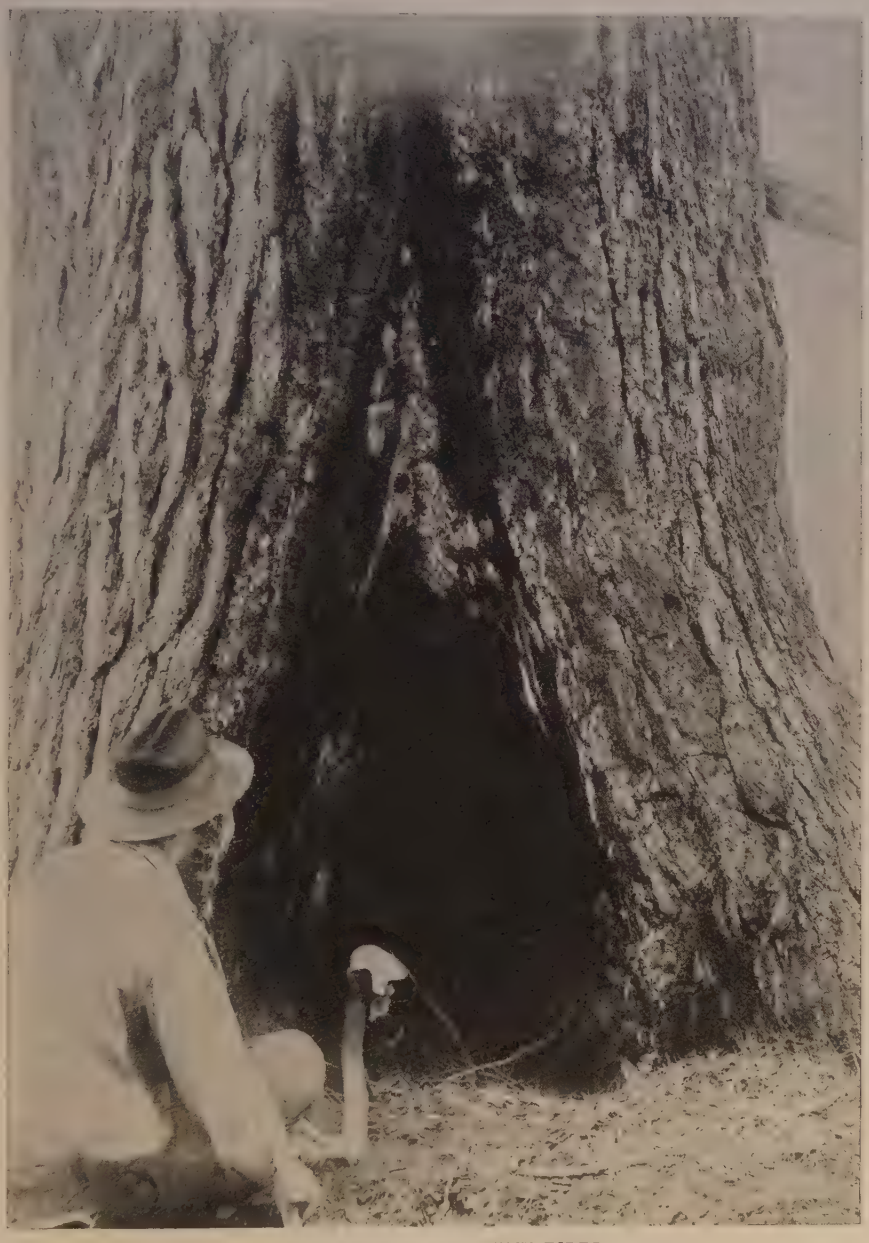
Seedlings of forest trees germinate in open spaces but along with them come brush species.

manzanita, ceanothus and chinquapin. Suppose now a second fire follows in a few years. The young trees, thin-barked and tender, are readily susceptible to damage by heat. And when they are burned, they are dead. But the brush, even if burned to the ground, is not dead. It sprouts, vigorously and prolifically. It captures the ground, for young trees can only with difficulty compete with it.

Then comes another fire. The brush—a dense patch of it—highly inflammable, flares up, and the fire reaches the crowns of surrounding mature trees. Once ignited, they burn, and the trees, blackened and bare, remain standing as snags.

Tree destroying beetles, aided by fire injuries to living trees, further accelerate the attack. By mass action they kill veterans, adding to the fuel ready for the next fire. Here modern science flatly contradicts the assumption that the beetles are a new thing, aided in their depredations by fire exclusion. Marks of insect attacks of many decades ago are evident to the trained entomologist. Failure to recognize their work in the past cannot be regarded as anything but faulty observation.

Thus the small opening in the forest is enlarged by each fire. Various such openings join and the timber becomes more and more open. Each fire extends the realm of brush. The more brush, the greater the heat and destructiveness of the fire. The more open the timber, the greater the sweep of the wind and the greater the intensity of the flames.



THE VICTIM OF ANCIENT FIRES

Gradually the fire scar has eaten deeper into the tree, which has had to fight to persist.

The forest does not vanish without a struggle. Seedlings in countless numbers come in after each burn. Here and there, through the protection afforded by natural firebreaks or through uneven spread of the flames, the young trees escape.

If this is a correct picture of how fire acts in the individual pine forest, what should we expect to find in the region as a whole? In favored localities, the virgin forest should be almost unbroken. Near the lower edge of the timber belt, where heat and dryness would aid fires and hinder forest trees, the brush should have gained the upper hand. Elsewhere, we should find all stages between these two extremes.

A comprehensive view confirms this forecast. Nearly one acre out of every seven originally timbered has been swept bare of trees by fire and is now occupied by the worthless brush. That is a penalty we pay for past fires. Even with a partial stand of timber, the two million acres of brush fields would run all the sawmills in the nation for more than a year.

The next worse stage is also to be found in abundance—the forest reduced to groups and patches of veteran trees, with brush elsewhere. Here probably not over one-tenth of the potential timber is present.

Even the best of the virgin forest, imposing as it is, is far less than fully stocked. So, in counting the cost of fire, it is not alone the denuded land that must be reckoned with, but also the incomplete forests.

This brief and incomplete outline of what fire has done to forests leaves our burning friend no evidence to justify his claim that fire is a benefit. But he is persistent.

"Well, anyway, those brush patches are no good for timber. Might as well get something out of them. Burn 'em good and hard, and the cattle can get the feed. A jackrabbit can't travel there now. I've got some cows myself that are running short on pasturage."

Here are some more pertinent questions. What can be done with the brushfields? Is fire in them of no moment? Is grazing the best use of the land?

The simple, direct way to answer is to examine a brushfield—something few of the critics appear to have done.

We find that where even scattered seed trees have survived, timber is coming back. Search under the dense canopy of the brush discloses slender, weak-looking young trees. Apparently they are waging a hopeless battle. But a second examination a few years later will show the same trees well above the brush, building up large and vigorous crowns.

Now it is the brush that appears sickly compared with them.

As the years pass—given always fire exclusion—the brush gradually is killed out. The forest comes back. Finally, one of those fine second growth stands, with forty to sixty thousand board feet an acre occupies the ground.

In most parts of the pine region, where timber has been in the past, timber will grow again. On the worst devastated lands, the recovery will be slow. But to assume that a brush-field in the timber belt is a permanent fixture is to ignore the plain evidence.

But suppose, to aid a worthy local industry—stock raising—we permit fire in a restocking brush field. What will happen, and will the returns offset the losses?

When experienced fire-fighters can be induced to expound, the most eloquent tales deal with brush fires. A fire in heavy brush nearly always consumes everything and assumes all the characteristics of a crown fire in timber. Rapid spread, intense heat, and jumping make control both difficult and dangerous. So brush fires, once under way, sweep with terrific force into the adjacent forest. The outer belt of trees is wiped out and into this captured zone the brush soon enters.

Fires in brush thus not only destroy the young trees struggling to recapture the brush land. They extend the brush field as well. Moreover, the brush after the fire becomes denser than ever.

A brush field in the timber zone makes the protection of surrounding merchantable timber difficult and uncertain.

Light fires in virgin forest are destructive enough. They cause damage to merchantable timber. But they do not usually wipe out the forest. Fires in brush do just that.

When we come to examine the relative value for timber and grazing of the brush field, the last argument in favor of fire vanishes. For timber growing each acre—given fire exclusion—will produce an annual value of from 25 cents to $1. For grazing, the small amount of forage available is rarely worth over 15 cents an acre and usually less.

In the California pine region, as elsewhere, uncontrolled fire is an enemy, a destroyer. The reasoning which assumes that fire is a benefit, because forests have persisted in spite of it, is patently fallacious. It ignores the evidence found in the forests and brush fields. Such reasoning is as ridiculous as it would be to argue that impure milk is desirable because a few infants can survive such a diet.

Modern civilization requires wood. It requires forests for other indirect benefits, of which not the least is recreation. It requires fully stocked forests, not broken and patchy remnants. To attain this goal, fire must be excluded.

Cherokee Beans

By Mary Francis Baker

CRIMSON flowers of our native Cherokee beans, or coral plants, flame from thickets in Florida during winter and spring, and attract attention by their brilliant color and peculiar form.

These shrubby plants, which belong to the same genus as the famous coral trees of India, beloved of Krishna and, according to Hindu mythology, former ornaments of the gardens of heaven, are extraordinary in several particulars—from their incredibly long and heavy roots to their gaudily colored seeds.

Although their flowers are formed on the same plan as others of the bean family, they exhibit a remarkable variation of that plan as their display is due to one narrow, folded petal, the standard, which is nearly two inches in length. The other four petals are so small that they are hidden within the dark red calyx. The seedpods, too, are attractive and interesting for they are oddly constricted between the seeds, and when ripe remain partly open for many weeks, disclosing their bright scarlet beans to our view.

CHEROKEE BEANS

They are also known as coral plants and their crimson flowers flame in Florida during winter and spring.

Erythrina herbacea, with prickly stems two to five feet in height, is common in many places in the South, and often blossoms before the bluish green, three-foliate leaves appear. The taller *E. arborea,* similarly armed, and with similar leaves and flowers, is found only in the southern part of the Florida peninsula, where it grows as a shrub or small tree, or even as a woody climber in the hammocks. It is the only member of the genus which is found on the Florida keys. Here, owing to the fact that these coral islands are bathed by the same waters, seeds from Cuba, the Bahamas, and some of the islands of the Lesser Antilles, have at various times found lodgment on their sandy beaches.

So we find our treelike coral bean keeping company with exotics of many widely differing groups, which reach our territory only on these wave-swept isles. This condition well illustrates the method by which even the smallest of oceanic islands become planted with vegetation fitting to their soil.

PHOTOGRAPH COPYRIGHT CHARLES L. SHEELY

The Monarch of the Crag

By Charles L. Sheely

IF ONE wishes excitement, much back-breaking and breath-taking labor, just try a close-up picture of a mountain goat in his habitat, the "high country," in the summer time. Then if something more difficult is required, let him try for a "shot" at an outlaw sheep between nine and eleven thousand feet above the briny.

It was a lazy afternoon in July, just cool enough to be comfortable. We were, the four of us, almost at the top of the Garden Wall, a twenty-mile ridge, formidable and beetling, in Glacier National Park. Below lay a wonderful scene. Above was to be another.

"Pss-s-s-st. Pss-s-s-s-st," a companion warned. Conversation ceased abruptly. It was no moment for talk.

He pointed to the north. There, not more than two hundred yards was my outlaw ram making his way north along the east side of the Wall. I grabbed a film pack adapter and the reflex.

The quarry was not alarmed. The old sheep walked with an air of determination and of knowing where he was going. Just a half mile north was a gap in The Wall. To go along the west side faster than the sheep along the east side was my only chance. The animal was occupying the only known trail, but it was now or never. Steep shale slides, upjutting pinnacles of rock, precipitous cliffs, it seemed, would never end. Not even a goat thought enough of this side of the ridge to lay out a trail. But end they

did. No sheep in sight when the gap was gained.

"The picture of all pictures!" There he stood on the edge in bold relief against gathering storm clouds, the real monarch of the crag. Cautious raising of the head, the camera. A snick of a shutter. Through a niche in the boulder shelter, the king of them all was seen to come closer to a snowbank that lay between. His nostrils twitched, telling what the eyes failed to see. At about sixty feet he stopped—smelling again and again the human thing that was blocking his path. Only an instant did he pause. Enough!

Introducing the Kiwi or Apteryx

By Edward A. Preble

THE KIWI, or Apteryx, combines many of the peculiarities of several widely differing groups. The result is one of the most remarkable birds now living. Though there are several species, they resemble each other so closely in structure and habits that for present purposes they may be considered together.

The Apteryx is found only in New Zealand, the home of the extinct Moa, and its skeleton shows a certain relationship to that bird. The feathers somewhat resemble soft coarse hair and this conceals the tiny remnants of wings and tail. The color is some shade of brown or gray, sometimes spotted, and the young do not differ appreciably from the adults in color or form. Studies of the structure of the bird have convinced naturalists that the Kiwi is descended

THE KIWI HAS THE ODDITIES OF SEVERAL BIRDS

It was once a flying bird but the absence of enemies apparently moved it to give up aviation and now its wings are mere stumps.

from flying ancestors. Absence of enemies evidently led the bird to give up flying, and ages of nonactivity have reduced the wings to mere crooked stumps an inch or two long, terminating in a short horny claw. When the bird sleeps, however, it still attempts to thrust its head beneath this useless appendage, a habit that argues for former possession of worth-while wings.

In giving up flight the bird has developed certain abilities which compensate in a measure for that loss. Its legs are very strong and enable it to run with speed and endurance. While feeding it is constantly sniffing and its sense of smell seems to be remarkably developed, probably surpassing that of any other bird. Its eyes, however, are small and weak and seem chiefly useful in directing the movements of the long bill, with which it probes the soft ground for worms.

The Apteryx usually lays two eggs, but sometimes only one. These are white and proportionately the largest eggs laid by any known species, being four or five inches in length, and weighing nearly a quarter as much as the parent. The nest is a sort of burrow usually excavated at the base of a tree or in the cavity of a log or in some handy stump.

The labor of incubation is shared by both parents. The young, unlike most birds, have no distinctive juvenile plumage, and exhibit few characteristic juvenile traits, seeming to accept the responsibilities of life, as far as can be judged by their demeanor, at the start.

The Kiwi seems to have acquired its virtually defenseless condition as a result of the lack of natural enemies, but it has been unable to cope with man. Though it is an inhabitant of the forest and entirely nocturnal, the demand for its flesh and soft-clothed skin has long ago greatly reduced its numbers. The birds usually travel in pairs or small companies when feeding and call to each other with a whistling cry which can be imitated so closely by the Maori hunters that the birds are easily decoyed. The use of torches and of dogs to trail and worry the birds has proved so destructive that except in the wildest mountainous tracts, or on certain reservations, the birds are no longer common. In all probability, however, the great interest that attaches to the bird because of its peculiarities will cause it to be preserved.

The Meadow Bluet

CLEAR among the memories of childhood are the broad moist meadows where unnumbered thousands of these lovely flowers opened in the May sunshine. We are thinking of middle New England, but little *Houstonia coerulea* ranges widely, and the grown-up child of most sections of our eastern states or southern Canadian provinces may share these pleasant memories. In the north the season of bluet is short, but farther south its blossoming period stretches out over most of the year.

If one studies the little plant, he ceases to wonder at its abundance. Two forms of flowers, with different arrangements of the stamens and pistils, ensure cross-fertilization of the highest order. In one form of blossom, the insect seeking nectar in the deep tube is sure to dust his head with the pollen from the anthers near the orifice. Flying from clump to clump, he sooner or later encounters a flower with the stigma near the orifice and here he inadvertently leaves some of the pollen in the only place in the world where it will be effective, for the pollen of each form of flower will fertilize only the other. And since the little flower welcomes as visitors butterflies, bees of many kinds, besides flies and beetles, it has many helpers in its work of brightening the meadows. Each of these willing workers, who gladly labor through all the long daylight hours, feels well repaid for its toil, for at each tiny flower a taste of nectar rewards it. The bee, who takes life very seriously, hurries from one blossom to another with eager haste, seeming to grudge the time necessary to gather his store of sweet nectar in such tiny packages. But the small butterflies, who seemingly believe in a short life and a merry one, linger leisurely at each blossom, slowly folding and unfolding their bright-tinted wings as they sip the delicious nectar. And so the bluets spread their brightness, that each year eager children may gather in their chubby hands the dainty blossoms, and still *Houstonia* persists.

THE DAINTY BLUET OF THE MEADOW

The bee hurries from one blossom to another with eager haste, gathering the sweet store of nectar.

The Devil's Pitchfork

By Wallace I. Hutchinson

NATURE, in her more whimsical moods, aided and abetted by wind and weather, creates many grotesque forms of forest growth. Dwarfed timberline trees, gnarled and ghost-like trunks, twisted wood grains, burls, weird shaped limbs and witches' brooms are familiar sights to all who frequent the forests on business or pleasure. But there is one strange freak of tree growth, much sought after, which is probably more difficult than any other to find, and that is a tree with a perfect pitchfork top.

Forest legend has it that his Satanic majesty in fits of anger was often wont, in days gone by, to cast his pitchfork, used for the prodding of lost souls across the River Styx, down upon the earth where it would stick upright in the ground—to become in time a giant tree for the blessing and use of man. The legend further relates that no matter how stately or beautiful the tree might grow to be with the passing years, the tip of its trunk was always marked, among all the trees of the forest, with a triple-tyned fork of dead wood, emblematic of its bestial origin.

NATURE IN WHIMSICAL MOOD

It has, therefore, become a pastime of foresters, in their travels through the woods, to keep a keen lookout for pitchfork-topped trees. Many trees with two-tyned forks have been discovered, but it remained for a timber survey crew working in a National Forest in California to find a three-tyned fork tree, which from its perfect form and the vivid lightning bolt streak that creases the trunk from top to bottom, leads one to believe that it must have been Beelzebub's prize instrument of torture. The tree is an incense cedar, some 50 feet in height, located near the junction of Bubbs Creek and the South Fork of Kings River in the Sequoia National Forest.

Are Shot Injurious to Trees?

By F. R. Cuykendall

IT WAS surely an odd chance that made us saw through an eighteen-inch log right into a lead shot that must have been lodged there about sixty-five years, for I counted sixty-five layers between the pellet and the bark.

It will be observed that the shot is embedded in the edge of the crack or check near the heart of the log. This crack is colored a dark brown, evidently decay. The portion where the shot is embedded and the longer strip of decay are joined, although the jointure is not clear to the eye. I am wondering if this shot had anything to do with the decayed crack or seam.

The tree was very old as the spot on the under side of the log will show, and was about twenty-four inches at the stump. It has always been my observation that the heart of the beech is generally clean. Therefore I wondered if the shot in the crack had any significance.

THE TREE HEALED THE WOUND

Note the little white dot where the shot was found, embedded for sixty-five years in the tree.

The sight of the shot there set me to thinking. I wondered who had fired the shot so many years ago. Dead and gone these many years, no doubt. Perhaps he was shooting at a squirrel, and it may be that he had a fine squirrel supper that night. The gun used must have been an old muzzle loader which with the black powder then in use must have made the woods ring.

WOMEN'S CLUBS REPORT ON TREE PLANTING

Girl Scout Leaders in Training Camps Study Forestry Primer—Indian Pupils Join the Tree Planting Army

THE GREAT tree planting work being carried on by the General Federation of Women's Clubs is outlined in the report of Vida Newsom, chairman of the committee on Highways and Memorial Tree Planting. This report was submitted to the biennial convention of the General Federation of Women's Clubs in Atlantic City last month. Fine reports on the work by states is incorporated in Miss Newsom's outline.

They include details by Mrs. Robert Wood, Tate, Tenn.; Mrs. J. O. Lakin, West Virginia; Mrs. A. C. Coolidge, Kansas; Mrs. C. E. Caldwell, Ill.; Miss Anne L. Guillion, Ky.; Mrs. C. E. Kelley, Maine; Mrs. J. P. Schwarg, Minn.; Mrs. H. B. Hancock, Okla.; Mrs. C. E. McPhail, Md.; Mrs. Harry Vincent, Iowa; Mrs. J. C. Urguhart, Calif.; Mrs. Thomas Greenless, Washington; Mrs. Paul N. Geiger, Ohio.

Tree planting has been done as memorials to soldiers in thousands of places. Several of the State Federations have Memorial Parks to their credit. In other states the "Memorial Acre" idea has been adopted. The plan of a tree for every member of the Federation is being taken up in every state.

* * *

At the training camps for Girl Scout leaders, the Forestry Primer is being studied this summer at the suggestion of Mrs. Jane Deeter Rippin, the director. These leaders will thus be able to take the forestry message home with them to tell the members of the various scout troops. At Camp Andree, above New York City, a reforestation plan is underway. In many parts of the country Girl Scouts are joining the tree-planting army.

Not only are the leaders studying the facts in the Forestry Primer, but hundreds of troops now have the facts before them. Among those recently putting these facts before the Girl Scout troops are Flora B. Mundy, Catherine Argus, Mary J. Littlefield, Myrtle Burton, Roberta Risch, Mary E. Cramer, Helen M. Cowin, Alice O. Little, Ruth Stevens, Helen I. Swartzman, Helen Tingley, Mrs. Carl Karston and Melissa King.

* * *

Boy Scouts do not intend to let the girl's organization outdo them either in tree planting. M. L. Oxenham of the editorial department keeps constantly in touch with all bulletins issued by the American Tree Association. At Bristol, Tenn., Paul Smith, of Troop 7, has the merit badge for conservation and is spreading the tree-planting army idea. Reynold Neilson of Texas has listed forty-two boys in the tree-planting army. W. H. Gunn, of Chicago, still has his boys in the tree-planting leadership. Others directing tree-planting work are R. E. Keary, J. N. Gibson, S. D. Bogan, J. M. Butcher, H. W. Lidler and W. E. Heitzman.

Parent-Teachers Association, following the call sent out by Mrs. A. H. Reeve, the president, are studying the Forestry Primer and joining the tree-planting army. Requests coming from every section include those from: Mrs. Charles Cooley, Mrs. Paul R. Copps, Mrs. Drury W. Cooper, Mrs. Dr. J. E. Runnels, Mrs. Chris Moll, Mrs. Roscoe C. Abbott, Mrs. T. E. Cherry, Mrs. V. G. Anderson, Mrs. J. M. Huit, Mrs. Herbert M. Focht, Edith M. Miller, Mrs. L. T. Boyd, Mrs. Ernest C. Laudenberger, Mrs. Sara M. Spencer, Mrs. M. G. Stanford, Mrs. Emily Wolcott, Mrs. Fred Lee, Mrs. Allan J. Mole, Mrs. Rose M. Sistaro, Minnie Jean Nielson, Mrs. Samuel Borel, Miss Mary Darouse, M. J. Hall, Mrs. F. J. Gronde, Mrs. L. C. Whitlark.

* * *

Indian pupils of the school at the Crow Creek agency in South Dakota have joined the tree planting army as a unit, and Supt. W. E. Dunn has registered their trees on the national honor roll of the American Tree Association at Washington, D. C., the list are trees for Calvin Coolidge, Charles G. Dawes, John J. Pershing, Henry Ford, Herbert Hoover, Woodow Wilson, Edward Bok, Helen Keller, Warren G. Harding, Thomas Edison, Jane Addams, Abraham Lincoln.

* * *

The Kiwanis Club at Manitowoc, Wisconsin has joined the tree planting army 100 per cent, the 70 members each planting a tree. The Kiwanians have given a nursery plot to each Boy Scout troop, C. M. Gleason reports, and will present prizes for the best results. Charles Lathrop Pack, the president of the American Tree Association, has complimented the Kiwanis Club on the good work.

* * *

Under the direction of John L. Blood 16,000 trees were planted by school children at Utica, N. Y. He was assisted by E. M. Swigett, Superintendent of Parks.

* * *

A memorial tree to the "unknown soldier" has been planted on the Memorial Highway out of St. Paul, Minn., to Duluth. The maple with 349 other trees, on Highway No. 1, was planted by Gov. Christianson. Directly across from it a tree was planted in honor of Joyce Kilmer. Ramsey County American Legion members planted the rest of the trees. Helping in the program were Dr. N. G. Mortenson, Legion commander; Harry Churchill and Leo Groos, county commissioners; William F. Scott, city comptroller.

* * *

In keeping with the movement sponsored by the state and national federation of women's clubs to plant more trees, members of the Wasatch Literary Club of Salt Lake City, have planted a hardwood tree in Memory Grove. The dramatic section of the club was responsible for the planting, which was done to honor Zona Gale. Mrs. Esther Husbands read the poem, "Trees," by Joyce Kilmer, and Rufus Johnson, secretary of the city tree commission, gave a short address on "The Tree."

* * *

Memorial trees for two Presidents and one governor were planted at Mount Vernon, near Madison, Wisc., by school children and others, including three veterans of the civil war, Jesse F. Myersm, the Rev. Stanley E. Lathrop and Martin Nelson. An elm tree from Galena was planted for General U. S. Grant, one from Niles, O., for President William McKinley and one from Madison for Gov. Lucius Fairchild. The exercises were under direction of John S. Donald, who has been instrumental in bringing many historic trees to the village. Mrs. Caryl Fairchild Jacobs, daughter of General Fairchild, came to witness the planting of the tree in her father's memory.

* * *

The High School at Gouverneur, N. Y., has planted 41,000 trees, as Scott L. Brown, the superintendent, watched the 100 pupils. The trees were obtained by F. E. Cox. Prof. R. D. Gibbs directed the work.

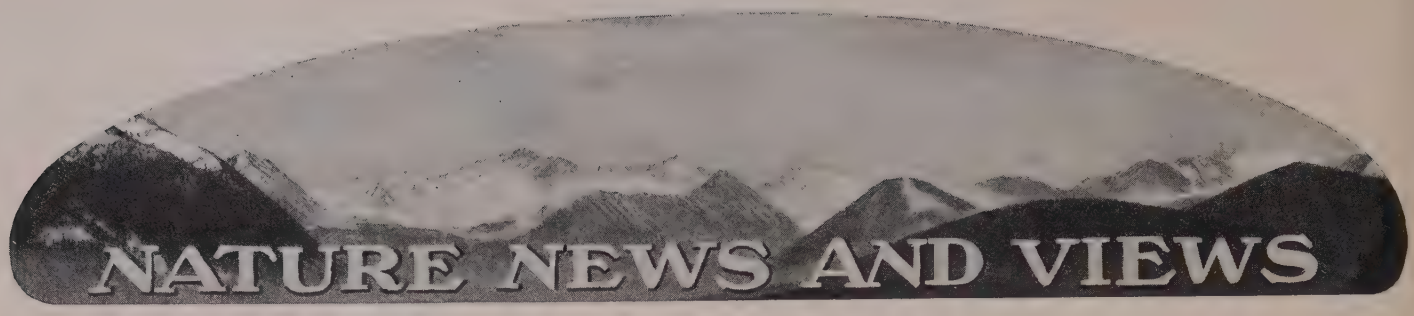
* * *

Under supervision of the Connecticut Forestry Association, 24,000 trees were planted on State Park Reservations by Boy Scouts. The work was directed by E. L. Machol.

* * *

Young Denver is behind the Chamber of Commerce water conservation movement. Approximately 1,000 members of the Order of De Molay, paraded the streets of the business district, preparatory to the largest tree-planting exercises ever held in Colorado. The Denver De Molays were joined by a detachment, from Littleton, and went to McDonough ranch, near Golden, where 3,000 young trees were planted.

Members of the forestry committee of the Denver Chamber of Commerce rode in an old lumber wagon, hauled by two big gray horses. Those in the wagon were: Mary C. C. Bradford, Mrs. C. M. Lillie, Mrs. Arthur Carhart, William M. Marrs, W. A. Hoover, Godfrey Schirmer, Benjamin Griffith, L. D. Sweet, F. D. Zimmerman, W. J. Morrill, A. S. Peck, J. H. Gabriel, Chester A. Lee, Carlisle Ferguson and Mrs. L. R. Grimes. Harry Bunday was marshal of the parade, which was assembled by Albert Haanstad, adviser of the Denver Chapter of the De Molay. Upon the arrival of the party at Apex gulch, Georgia Marrs planted the first tree. Details of Boy Scouts and De Molay boys were then formed, and the trees were all in the ground within an hour.



Dr. Hornaday Retires

After thirty years of distinguished service, Dr. William T. Hornaday retired as director of the New York Zoological Park on the first of June. The announcement that he would assume the title of Director Emeritus has brought many tributes from scientists, naturalists, city officials and others to the accomplishments of three decades. Dr. Hornaday, already the author of twenty books and many articles, plans to devote himself to writing now that he will not have the responsibility of the Park on his shoulders. He will be succeeded by Dr. W. Reid Blair, assistant director of the Zoological Park since 1922.

Costly Romance

A company of three young people were recently fined ten dollars each for carving their initials on the bark of a big sycamore tree in the Orange County Park in California.

"What is to become of romance when the young folks cannot carve their initials on trees?" someone asked County Forester McKeague.

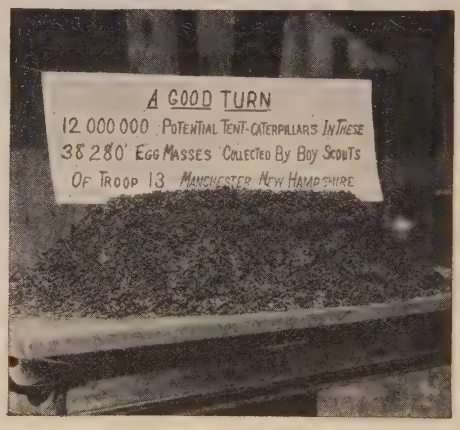
"I don't know about that," he replied, "but I do know what will happen to the trees if they keep hacking them up. Dry rot sets in unless we find the cuts when they are fresh. If we can get it in time, maybe we can save the tree, and maybe not. Orange County spent fifteen thousand dollars in tree surgery last year at the county park alone, and that's pretty expensive romance."

Los Angeles Club

Nature lovers visiting Los Angeles have an opportunity of a happy association in the Los Angeles, California, Nature Club. The club meets for dinner every Tuesday evening at six o'clock on the third floor of Boos Bros. Cafeteria at 648 South Broadway. Lectures and discussions follow, covering a wide range of subjects. There are frequent field trips of marked interest as well. The visitor wishing to get in touch with the club can do so through the secretary, Nellie P. Miller, at 3552 North Griffin Avenue. The president of the club, Mr. Alfred Cookman, broadcasts from station KMTR every Friday evening at 7:30.

Is This a Record?

Below there is an illustration showing a distinct achievement by the twelve Boy Scouts, members of Troop 13, of the Goffs Falls, Manchester, New Hampshire Council. The picture shows no less than 38,230 egg masses of the tent caterpillar gathered


A GOOD TURN
12 000 000 POTENTIAL TENT-CATERPILLARS IN THESE
38 280 EGG MASSES COLLECTED BY BOY SCOUTS
OF TROOP 13 MANCHESTER NEW HAMPSHIRE

by the boys of the troop during a period of seven weeks and about 510 hours of service. In the April issue of NATURE MAGAZINE there was an article on the tent caterpillar and how to control it. Special bulletin reprints have been made of this article and are available to members on request.

Model Forest Created

According to present plans, the Fremont field laboratory of the Rocky Mountain Forest Experiment Station, a forest tract of 160 acres on the side of Pike's Peak, is to be handled as a model forest. For a number of years the Forest Service has been conducting experiments here in methods of cutting and planting, and has been studying the influence of climate and soil on timber growth. These studies will be continued, but in addition it is planned to make of the entire area a model forest which will serve as a demonstration of how forest land in this region should be handled and what it can be made to produce.

For the Museum

An addition of about $750,000 to the endowment fund of the American Museum of Natural History was made through the bequest of the residuary estate of Wood Fosdick to the Museum. Mr. Fosdick passed away recently in his eighty-eighth year. The bequest came as a complete surprise, Henry Fairfield Osborne, president of the museum, announced, because it was not known that Mr. Fosdick was at all interested in the work. The fund now lacks but a few dollars of thirteen million, the goal being a twenty million dollar endowment.

Arnold Arboretum

To all who have interest in growing things, whether that interest be professional, amateurish or affectionate, the Arnold Arboretum needs no further encomium. In botanical circles it is given its just due. Popularly, no doubt, it is not fully realized what immense importance it has been and is in providing accurate information of botanical and horticultural character. For fifty-four years it has served notably, dependent though it may be upon voluntary contributions from public spirited citizens, horticulturists, lovers of gardens, trees, shrubs and all that is beautiful in Nature. The lists are now open for contributions for the current year, and Charles F. Adams, treasurer of Harvard University, Arnold Arboretum, Jamaica Plain, Massachusetts, is the one to address.

Moth Quarantine

Certain areas in Vermont, Massachusetts and Connecticut were released July first from the quarantine restrictions which have been in force there on account of the gipsy moth and brown-tail moth.

From Hainan, China

Nature Magazine goes to many out-of-the way corners of the world and is welcomed doubly for the distance it must travel. Miss M. M. Moninger of the American Presbyterian Mission at Kiungchow, Island of Hainan, China, writes that it serves frequently in her science classes.

"There are big-tree ferns," she writes, expressing the wish that she could show fellow-members the beauty of the Hainan trails, "tiny-rock ferns, climbing ferns and air ferns, any size you wish. There are 'dragon's whiskers' three and four feet long upon the trees, and flowers that beggar description. Nature study here is absolutely fascinating. In the mountains of the interior there are fine forests, but the nomadic Miao tribes are destroying them rapidly. They burn off the trees, plant their rice a year or two, vegetables a year or two, and move on, leaving the scarred land to grow up to a wild second-growth of inferior wood."

Concerning an Aeronaut

I had been in the habit of taking my lunch out on the campus during the summer. This time I chose a spot where a little grassy hollow dipped down to the very edge of Lake Bemidji, and a juicy green basswood spread a low tent over my head. Myriads of aphids feasted on the succulent new shoots of the basswood; but the tree didn't seem to mind, and only kept on growing more luxuriantly green than ever. There wasps, lady-bird beetles, and aphis lions scoured the upland pastures for their prey, and tiny black ants waged perpetual war upon the enemies of their herds.

I finished my lunch, brushed all the crumbs and several pieces of cake-frosting into the deep grass, and sat lazily watching the industrious little black midgets bustle about to gather up what I had sown. Somewhere from the leaf canopy over my head a diminutive aeroplane spun, pirouetted, circled, looped-the-loop, spiraled downward, and finally alighted on the ele-

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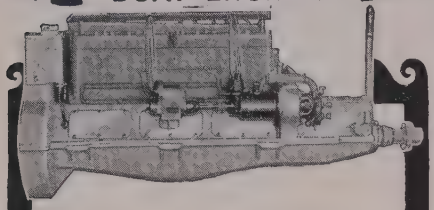

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vated landing-plane of my knee. The little aeronaut dismounted, gracefully, but with a business-like air, and, without a moment's hesitation, proceeded to carry her protecting plane down the steep declivity of my trousers leg and into the heavy jungle of grass at my feet.

An ant had caught an aphis lion among her choicest herds, and, waiving an introduction, had consented to take a ride with the pretty green-winged creature. However, upon their arrival at a spot nearer earth, she had carried away her pretty hostess to be her guest at some subterranean banquet in Antdom.—C. F. C.

Members, Attention

To any members of the American Nature Association planning a holiday in the Canadian Rockies this summer the Alpine Club of Canada extends the privileges of its club house at Banff, Alberta, through our mutual membership in the Associated Mountaineering Clubs of North America. The club house is on Sulphur Mountain, having a large living room, library, writing room, spacious verandas and dining-room attached. There are wood-floored tent houses on the property for sleeping accommodations. Any members expecting to avail themselves of this invitation are urged to indicate so in advance by addressing the manager, Alpine Club House, Banff, Alberta.

Another Nature Column

What can be accomplished by a local newspaper in the field of Nature is again proved by the *Reporter and Argus,* a weekly newspaper at Port Allegany, Pennsylvania. Each week there is a delightful Nature column edited by Joseph Coombs Galloway of the Eden Nurseries in that community. Mr. Galloway proves himself by his column to be a naturalist of wide interests, inspired, no doubt, by his work with and interest in growing things. The department is notably well written, and one of its accomplishments has been to develop a group of enthusiastic young naturalists. More power to the *Reporter and Argus,* to Mr. Galloway and their followers.

Life at the Pole

According to Fredrik Ramm in a copyrighted wireless to the *New York Times* from the airship *Norge,* no evidence of birds or mammals was seen from over the pole down to the Alaskan coast. The last living creatures observed were white fish swimming in a lead some miles from the pack of ice, he reported.

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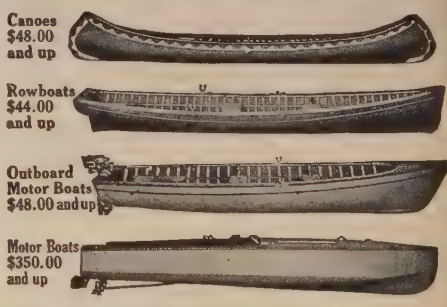

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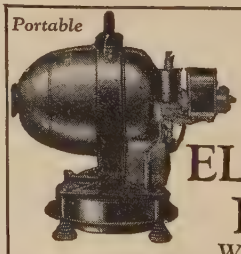

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"Meeko, Squirrel Orphan"

By Loring W. Turrell

It was in the deep woods where Meeko was found, I was walking there one day with two friends. Suddenly a loud, shrill cry broke the stillness of the quiet woodland. We followed the direction of the cry and as we were passing under a large spreading tree a tiny limp form fell to the ground at our feet. Picking it up, we discovered that it was a baby squirrel. Again the piercing cry sounded, this time from above; clinging to the tree about twenty-five feet up was a second squirrel orphan. We reached a long stick up to him, he clung tightly to it and we safely lowered him to the ground. The first one apparently was so weak that he could no longer cling to the tree. Their parents we thought must be dead, so I adopted one and my friend the other. At first we had to feed him forcibly with a medicine

dropper, but he soon learned how to suck the milk from it and would sit up very prettily, holding it in his forepaws with tail held over his back. He seemed to enjoy human society and would climb all over me after he had been fed, making a curious purring sound. We named him "Meeko," an Indian name for squirrel.

The Wasatch Rambler

May Day was the natal day of *The Wasatch Rambler,* an attractively prepared and printed little publication that becomes the official organ of the Wasatch Mountain Club and Salt Lake City, Utah. It is to be a bi-monthly devoted to notes of the club's work and its rambles, and seeks to give voice to the conservation interests and outdoor aims of the organization. J. D. Derby is president of the club, and L. P. Stoney, Mary Pack and Gerald Thorne share the editorial responsibility of the little publication.

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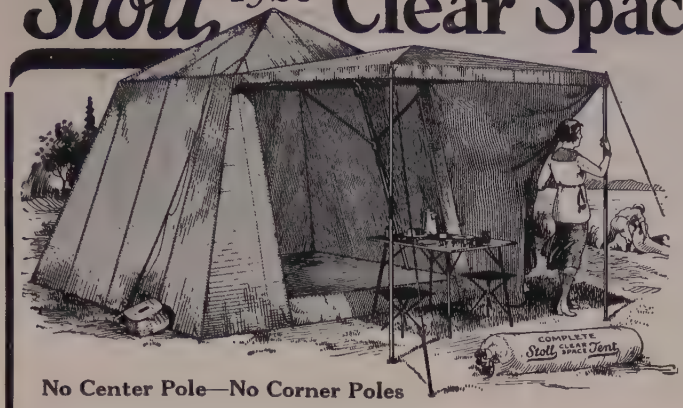

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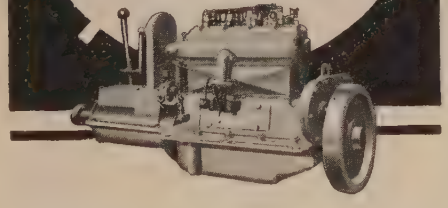

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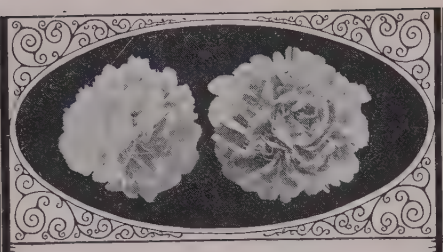

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Nature Magazine Experts will answer any questions about flowers, shrubbery, birds or animals. WRITE—and ask The Editor.

A Real Missionary

It is with no small pride and with a great deal of pleasure that we quote the following three paragraphs from a letter from Dr. Hyla S. Watters, of the Wuhu General Hospital, Wuhu, Anhwei, China:

"NATURE MAGAZINE is greatly appreciated here. Not only do all the Americans in our group enjoy it, but the Chinese do as well. Many times I have broken through the reserve of Chinese guests who were unused to talking with foreigners and therefore ill at ease, by the simple expedient of bringing a copy of NATURE MAGAZINE and showing them the pictures. It never fails. In a few minutes we are chatting together gaily, comparing experiences and stories of animals, birds, or plants. And many are the bits of folklore that one gleans. For instance, there is the story of a deer that was sheltered from hunters by a kindly old gentleman who was a lover of flowers. In token of gratitude, the deer later returned, carrying in his mouth a root which he carefully planted in the old gentleman's garden. Under careful tending this grew to a bush that bore gorgeous red blossoms, each petal of which was edged with gold. That was in ancient times, but the bush is said to be still blooming; but alas, in these degenerate days it is less carefully tended than formerly, and the blossoms are like ordinary ones, without any gold edges!

"I wish you would relay Mr. Bruce Horsfall my thanks for his beautiful illustrations. The colored ones that have come as separate sheets in the magazine have been mounted on scrolls and hung in the classrooms of the grammar school here on the hospital grounds; greatly admired by all the kiddies, they do a lot 'to stimulate public interest in every phase of nature.' A few that have not been hung in the classrooms have been presented as prizes, to the great delight of the winning students and the pride of their families. Because of their beauty, as well as for the reason that the Chinese have tremendous admiration for scholarship, these prizes are treasured possessions in the homes to which they have gone.

"One phase of conservation that needs to be popularized here, if famines, floods, and poverty are to be overcome, is reforestation. The pictures of forests and trees that often occur in the magazine gives splendid opportunity for teaching that lesson, which is obvious once it is explained. So you see in many ways the magazine is a real missionary, helping toward the same good results here as at home and doing much toward establishing mutual understanding as well!"

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An Excellent Idea

Coincident with the announcement by the Post Office Department that rural mail carriers will report forest fires seen along their routes to appropriate forest officers, the Western Forestry and Conservation Association is supplying its constituent protective organizations in the Pacific Northwest with "Report Forest Fires Here" signs to be placed along roads where residents, stores, filling stations or others will cooperate by telephoning the nearest fire warden upon report of fire by any traveler as well as by mail carriers. These signs are diamond-shaped of red and white porcelain enamel, following the standardized design adapted by the association for all its roadside signs in order to repeat the fire prevention regardless of wording carried. The impression on travelers to observe caution with match, cigarette and campfire will be achieved regardless of whether they see or report fires.

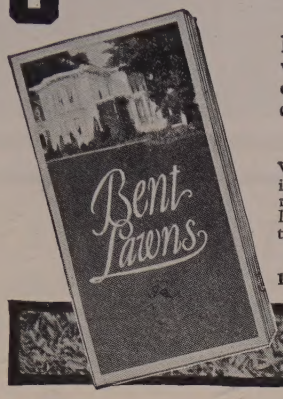
An Ancient Spruce

A piece of wood from a barge or yacht of ancient Rome has recently been identified by the wood technologists of the Forest Products Laboratory of the U. S. Forest Service here as a species of spruce. The specimen identified was recovered from Lake Nemi, near Rome. The timber from which it was taken is in the museum of the American Academy of Fine Arts at Rome, the identification being requested by an American friend of the director of that institution.

Specimens Brought Back

One of the results of the expedition that went from the United States Naval Observatory to Sumatra to observe the eclipse of the sun last January was the bringing back of a splendid collection of biological material for the National Museum and the National Zoological Park. Lieut. H. C. Kellers was detailed to the expedition by the Navy Department and led the work of collecting nearly nine thousand specimens. The collection includes reptiles, birds, insects, crustaceans, mollusks and mammals, both living and dead. The National Zoological Park was enriched by sixteen living birds and must find adequate room to house them until the prevailing economy program has run its political course long enough to permit real appreciation of the importance and pressing needs of this remarkable national institution.

SCOTT'S Creeping Bent



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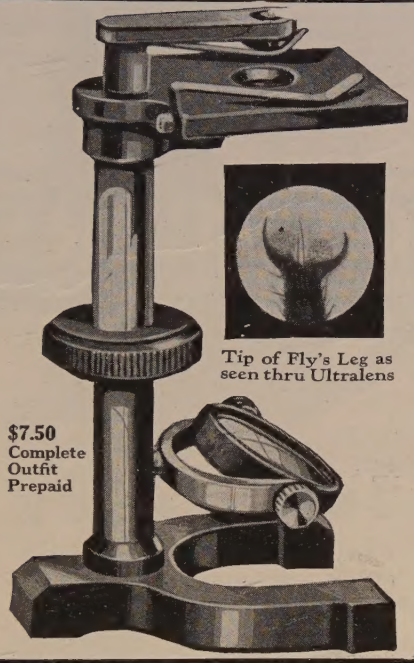

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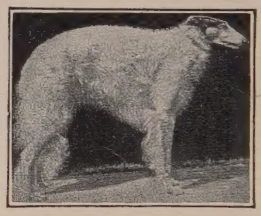

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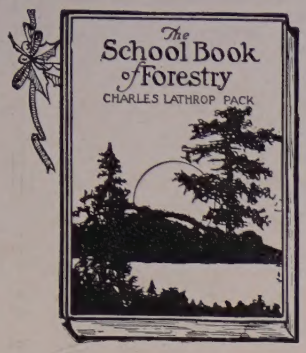

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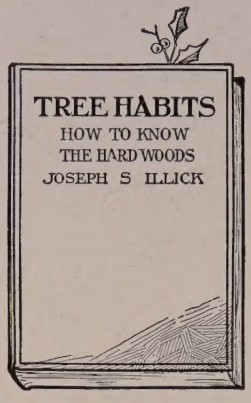

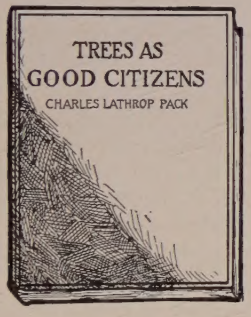

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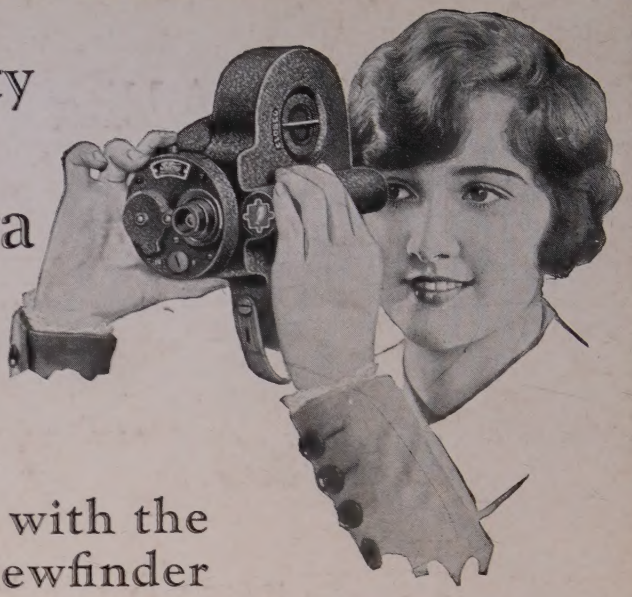

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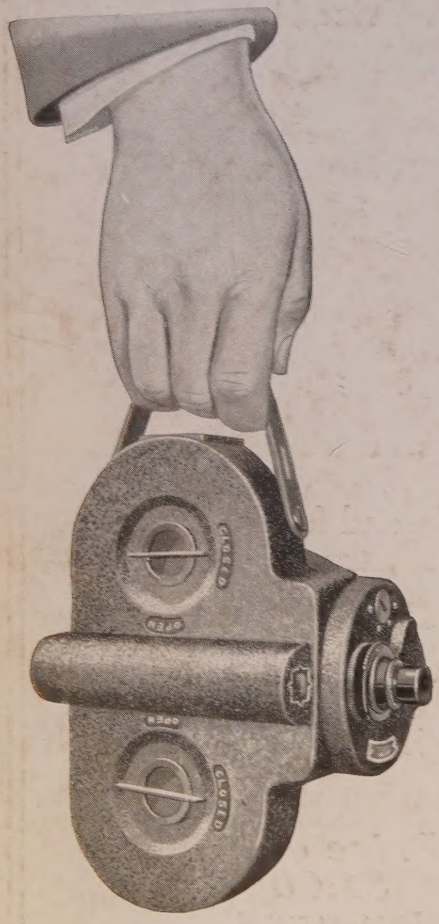

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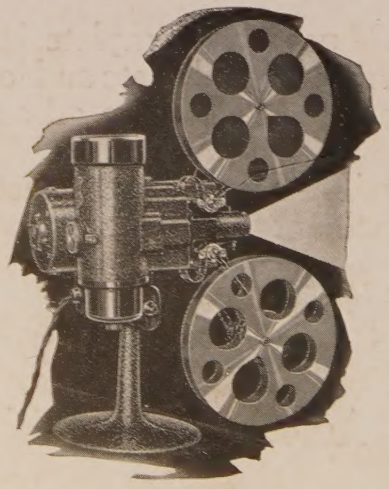

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